

AMERICAN FORESTS *and* FOREST LIFE



JULY, 1925



LOOKING FOR FORESTS IN CHINA
FIRE WEATHER . . . WILD FOWL



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The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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Member A. B. C.

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Name It and You May Win a Prize

This is such a striking example of the thriftiness of young forests when they are protected from fire that the Editor is inspired to offer a prize for the best popular name for the picture.

The name should be clearly written, popular in nature—not technical—and should not exceed twenty words in length. Here is a suggestion—"Homes for tomorrow."

Answers should be sent to Prize Picture Editor, American Forests and Forest Life, The American Forestry Association, 1523 L Street N. W., Washington, D. C., before August 1, 1925. Announcement of the winner will be made in the September issue.

The picture is used through the courtesy of the Great Southern Lumber Company of Bogalusa, Louisiana.

AMERICAN FORESTS

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A Forester's Search for Forests in China

Two Thousand Miles by Muleback and Afoot Into the Yellow River Country of the Dim Past

By W. C. LOWDERMILK
University of Nanking, China

FEW subjects present a more gripping interest than a contemplation of the earth as modified by human activity and the consequent effects upon the race of men. Northern China offers probably the most striking field in the world for such a study, for it was in the fertile irrigated alluvial plains of the Yellow River and its tributaries that Chinese civilization first came to flower. It was here likewise that this flower waxed and faded, very probably as the forest cover of the hills and mountains was used and destroyed. Into the great loess blanket covering the Yellow River watershed is woven the earthworks of a civilization dating back almost fifty centuries. Fragmentary remains of former populations, the denudation of the mountains, erosion on a gigantic scale, the silting up of river beds, evidences of floods and famines, provide abundant material for an entrancing study of man's relation to nature.

It was with this idea in mind that the writer, accompanied by Mr. O. J. Todd, Engineer of the International Famine Relief Commission, arranged a trip through Honan, Shensi, and Shansi in the spring of 1924. The journey required two months and covered a distance of over 2,000 miles, one-third of which was made by mule

cart, by muleback, or afoot. The starting point was at Kaifeng, Honan, near the point where the Yellow River in 1852 broke from its channel leading southeastward into the Yellow Sea and found a new course to the northwest into the Gulf of Chihli.

Kaifeng, the capital of Honan Province, is surrounded by two walls; one is massive and high, made of burned brick, turreted and flanked by bastions for defense against the armed invader; the other is broad and high, made of tamped earth for a defense against the vagrant flood waters of the Yellow River which have fourteen times succeeded in flooding the city. The surface of the plain about



OUR PACK TRAIN CROSSING A SMALL STREAM NEAR CHUNG PU, 150 MILES NORTH OF SIANFU

Kaifeng is broken by sand dunes, which have in the last two decades become more active, due to the cultivation of the peanut introduced into China from America.

Wind break forestry is much in evidence in this region. The landscape is strikingly marked where the sand is drifting, by rows of willow trees in close formation. The ready faculty of the willow to reproduce from cuttings fits it unusually well for wind break and sand fixing work. The willow (*Salix matsudana* K.) is the characteristic and ubiquitous species of the alluvial plain.

Other species than willow, however, are found on the



O. J. Todd.

FOLLOWING THE TRAIL ACROSS THE HIGHLANDS OF NORTH SHENSI. OUR COOK ALWAYS RODE HIS MOUNT. THE AUTHOR IS SEEN IN THE FOREGROUND, WEARING A CAP



THE TRAIL ACROSS THE LOESS LANDS IS OFTEN CROWDED BACK TO THE HIGHEST RIDGES BY THE DEEP GULLIES WHICH ARE CONTINUOUSLY CUTTING BACK. THE RESULTING STEEP CLIMBS GIVE THE TRAVELER WONDERFUL VIEWS OVER A SEA OF LOESS HILLS



W. C. Lowdermilk.

OUR PACK TRAIN CROSSING A PRECARIOUS TRAIL. ON THE LEFT THE GULLY WALL DROPS ALMOST PERPENDICULARLY 100 FEET, AND ON THE RIGHT A DIZZY DEPTH OF ALMOST 300 FEET. TRAVELING IN THIS REGION IS NOT WITHOUT THRILLS.

plain. Within and near the villages occurs a poplar (*Populus tomentosa* Carriere), an ash (*Fraxinus chinensis* Rox.) and the well-known *Ulmus pumila*, which is being widely tested in America. The Paulownia (*Paulownia tomentosa* Koch.) occurs singly, and supplies the light specialty wood so much in demand by the Japanese for sandals. The *Zizyphus* sp. or Chinese date is commonly grown for its fruit.

The difficulties and expense of inland transportation off the railway preclude the importation of outside timber supplies. Of necessity the timber supply—such as there is—must be grown locally. The village trees are practically the only source of construction material. Much of this timber goes into the massive coffins which iron-clad custom, established when timber was more plentiful, requires that the Chinese provide for the dead. It is no surprise then to find economies in the use of wood. The houses are constructed of brick and roofed with tile or thatch; the floors are of earth or paved with brick. Wooden furniture is reduced to the minimum. The scarcity of wood has brought the conveniences of the home and house to a low standard.

Wood is too valuable to be used as fuel, except in the form of branches. Tree leaves, twigs, grass, the roots and stems of agricultural plants are the chief vegetative fuel. In some places near the railway and river fine coal is mixed with mud, from which coal cakes are made and dried. These are burned like charcoal with a smokeless flame. No attempt is made to warm houses; fuel is only used for cooking purposes. To keep warm in cold weather additional layers of padded clothes are put on.

Seventy miles to the west of Kaifeng the railway leaves the great alluvial plain and enters upon the uplands which are characterized by the well known and incompletely understood loess deposits. A tawny landscape cut by deep, almost vertical, walled gullies, sunken roads and inhabited by cave dwellers, surrounds the traveler. The fields are leveled to conserve the scanty rainfall in the lower elevations. It confounds the imagination to estimate the amount of labor which has been expended upon loess landscapes to convert slopes into terraces. Homes are dug back into the loess banks and a few trees are made to grow on the steep banks and about the encaved villages. It is here that the *Ulmus pumila* is most commonly found. The pagoda tree (*Sophora Japonica* Lin.) is seen about the villages and furnishes the tough, durable wood used in the sturdy mule "Pekin" carts and the Yellow River boats.

Passing Lo-yang, the capital of the ancient Chow Dynasty, we continued on to the rail head, which was then at Kwomintang, where we ar-

rived after dark in a rain, the first fall for several months. The winter is the dry season, for the monsoonal winds blow off the arid interior of the Asiatic continent until the summer, when they are reversed and bring in the beneficent moisture from the distant Pacific. A small, unpromising inn gave our party shelter.

Shortly after dawn we caught a work train which took us a short distance to the point of track laying, where we took mule carts to the Yellow River at Chanchow. The cart roads of north China are the essence of "*laissez faire*." Instead of improving the roads, the carts have been more substantially constructed and iron bound, and mules and men are added to negotiate any condition which may develop. It is not surprising therefore that a traveler prefers to walk much of the way.

On the following day at an early hour we boarded two of the Yellow River sail boats. The crew consisted of five sturdy, unwashed river men who possessed great dexterity in handling the little craft under any circumstances. The wind favored us until the middle of the afternoon, when it died down. Then the crew set to poling. Frequently during the calms one of the crew between poling stood on the prow and hallooed and whistled with peculiar calls for the wind to blow. This is a custom, or almost a religious rite, on the river. It is understandable, for we tried the poling and we would have whistled too if it in any way would have caused the wind to blow.

The landscape viewed from the boat was essentially bare of trees except for widely separated groups or single trees of *Zizyphus* (Chinese date) which marked the existence of a village of caves. In general, the land appeared to be well worked over, and fuel gatherers were seen cutting dry grass off the slopes too steep for cultivation.

We arrived at Tungkwan, our river destination, about 9 o'clock on the second evening out, but stayed aboard until early the following morning. A stolid soldier permitted us to enter Tungkwan, the Gibraltar of Central China, through the overtowering and massive gates into an inner inclosure commanded by threatening turrets on all sides. Then by a right angle turn we passed through another massive gate arch into a narrow avenue commanded by embattled turrets and towers—surely suggestive of wars and sieges. The walls were all made of large blue burned brick.

One wonders where so much fuel was obtained to burn such enormous quantities of brick used in the ancient constructions of north China. Stone is very scarce generally, being covered by loess mantle. Burned brick used to take its place in the defense and fortification walls which are



O. J. Todd

WE ENTER THE GREAT CITY GATE OF CHUNG PU, IN NORTHERN SHENSI



W. C. Lowdermilk.

DESPITE THE BADLY REPAIRED SAILS, THEY CAUGHT THE BREEZE AND CARRIED US ALONG



W. C. Lowdermilk.

A MOUNTAIN VILLAGE IN A VALLEY WHERE THE STREAM HAS CUT THROUGH THE LOESS BLANKET TO THE UNDERLYING PRE-LOESS LANDSCAPE. NOTE THE TREES CLIMBING TO THE SLOPE IN THE MIDDLE DISTANCE



W. C. Lowdermilk.

THE VERTICAL CLEAVAGE OF THE LOESS ACCOUNTS FOR THE UPRIGHT WALLS OF THE EROSION GULLIES. WHEN THESE ARE UNDERCUT, GREAT BLOCKS CAVE IN TO SUPPLY THE TORRENTIAL RUN-OFF WITH FINELY DIVIDED MATERIAL

in some instances on a tremendous scale. It is impossible to conceive that sufficient fuel material is available in these times to burn any great quantity of brick within several decades. The manufacture of enormous quantities of brick ten centuries or more ago may be taken with other facts as an evidence of a larger supply of wood material than exists at the present time.

From the heights of the fortress of Tungkwang the view was impressive. To the southward were the lofty snow-capped Tsing Ling Shan (Mountains) rivaling the Canadian Rockies in grandeur. To the west lay the low, flat alluvial plains at the confluence of the Wei River with the Yellow River. The Wei Ho (River) is the principal tributary of the Yellow River; it gathers in its eastward course from Kansu the northward drainage of the lofty Tsing Ling Range. To the north stretched the loess highlands deeply dissected by the great gullies of erosion. And to the eastward the eye might follow the ominous muddy waters of "China's Sorrow" making their way in the deeply excavated valley.

Tungkwang has for thirty or more centuries been a strategic place; it is said never to have been captured by

direct attack. The Great Genghis Kahn starved out the garrison before he captured it. This inland fortress guards the great trade route from Asia Minor and central Asia to eastern China. Caravans have for unreckoned time made their way through this city, exchanging the articles of trade between Europe and Asia. Marco Polo passed here on his way to and from China. It was in Tungkwang that the Empress Dowager put her faith for protection after the capture of Peking by the Powers in 1900.

No forest growth is visible from the vantage point of the fortress. Within the city are numerous trees of cedar (*Thuja orientalis* Lin.) and pagoda tree (*Sophora japonica* Lin.). Great screaming hawks make their nests in the pagoda trees and fly unmolested just over the heads of the people.

(Continued on page 427)



W. C. Lowdermilk.

THE YELLOW RIVER—"CHINA'S SORROW"—FLOWS BETWEEN HIGH WALLS BETWEEN SHENSI AND SHANSI. THIS PICTURE WAS TAKEN ABOUT FIVE MILES BELOW THE CROSSING INTO SHANSI



AN AWESOME SCENIC FLASH OF WHAT MIGHT BE A GIGANTIC HALLOWE'EN SPECTACLE, COULD ONE MOTIVATE THE WEIRD ROCK FORMATIONS AND GIVE VOICE TO THE WHISPERING TREES—THE "CHICKEN ROOSTS." HIGH ABOVE, WITH THE SHROUDED FORMS OF THE "LOST SOULS" BOWING BEFORE THE FLAME-COLORED CLIFFS, THE LITTLE "GHOSTS" IN ATTENDANCE IN THE SHADOW OF THE SENTINEL SPRUCES.

The Gem-grotesque of American Scenery

BY ARTHUR HAWTHORNE CARHART

CRUISING the high mountain valleys of the Rockies on the back of a willful, but somewhat civilized, bronco often brings one into many places of unusual scenic wonder which are generally unknown. It

was on just such a trip through the million-acre Rio Grande National Forest, in company with three other adventurers, on horseback, that I was guided into the realm of nature fantastic—to be found in the Wheeler National Monument, fifteen miles by horseback from Creede, Colorado. This grotesque spectacle of extraordinary wind and rain sculpture needs only a road from Creede, the nearest motor highway and railway point, to become famous. Today it is little known and is visited by less than a hundred people annually, most of whom live within seventy-five miles of the wonder.

Bill Smick took us in. Bill is one of those fellows unmercifully pilloried in the red-blooded fiction of the West, but nevertheless mild-man-

nered and likable. He is a sheepherder *de luxe*—that is, he herds a half dozen Mexicans who, in turn, graze their woolly, blating, odoriferous bands under the ridges of La Garita Mountain.



"THE CAMEL"—HUMPS AND ALL—NATIVE, NOT OF THE EASTERN DESERT, BUT OF SCENIC WESTERN AMERICA

We did not enter the monument the usual way. Instead, our guide took us in over a trail he himself had constructed several years ago. As we topped the low saddle at the high point of the trail we stopped. There, a mile away, spread the Wheeler National Monument—one of the most extraordinary pieces of topography in the world. From our point of vantage it suggested a convocation of sculptured spooks. We hastened down a pleasant spruce-fringed draw and the effect heightened. A trip through the innermost scramble of fiendish rock shapes served to increase the impression.

Leaving the party, I started to cover the Monument by an uncertain foot trip. High above the spruce trees, towered a crowning upthrust of

salmon pink. Its sides were ribbed and fretted. At its base spruce trees fifty feet high reached toward the pinnacles. If it were not for these dark, dignified trees, one would not get a true impression of the Monument's magnitude. They grow in every little nook and miniature canyon. At other times

they seem to spring from solid rock, where no suggestion of soil is found. One is thankful for them. They add a touch of green to this curious rock pile.

A quick, rickety bit of climbing up the scaly back of a "ghost" brought me to the upper ledge that is above the more uncanny shapes of the Monument and below the cap rock of salmon pink. From the first good place to a stop a "rock picture" was visible. It was the outline of a camel, humps and all. A trip around the ledge unfolded vagary after vagary in rock.

The ledge varies in width from a few feet to more than seventy-five feet. It has the appearance of badly disintegrated concrete paving. There, on a side slope, walking along unguardedly, I had one of the most painful falls in four years' travel through the Rockies. I found that the soft, pebbly lava is not sound footing.

There are numerous balanced rocks within the Monument. Their supporting pedestals rise from a uniformly sloping surface. Their tops are caps of harder rock, which in every case have prevented the weathering of the pillar which holds them up. The amount of erosion that has gone on can be sensed when a visitor stands below one of these



ROCK FORMATIONS, APTLY CALLED "THE PIG AND THE POTATO"—FAMILIARS OF THE REALM OF THE FANTASTIC IN THE WHEELER NATIONAL MONUMENT

rocks which is neatly balanced on the top of a pedestal thirty feet up from the average level. The average grade was once the elevation of these cap rocks, for they are of harder substance carried there by the molten lava when it inundated this section. Five man-heights of lava have weathered away since

that time, leaving the hard piece of rock poised on the pillar of softer material which it protected.

At one point a rock nearly the thickness of a man lifts into the air about fifteen feet. It formerly carried a "crown" of harder substance, but that now lies at its base. The pillar had weathered so much that its top crumbled and the rock fell. Near by stands a group of half a dozen typical balanced rocks.

These rocks, poised on supporting lava columns, impress one by their number, if nothing else. At one point it is possible to count more than a dozen, while the total number which the reservation contains may be four times that number. Three pedestals, standing in a row, hold up rocks which look much like enormous specimens of coral. Another rock has the outline of a legless wild boar, while opposite it is a rock resembling a colossal potato, which the tusker seems to be reaching for.

Every step in any part of the Monument brings several different rock forms to view. Those who find attractive the pastime of seeing shapes resembling living things in natural rocks will find here uncountable forms.

The fantastic ramparts of the Monument are arranged



ONCE UNDOUBTEDLY THE PEDESTAL OF A BALANCED ROCK, THIS PILLAR HAS LOST ITS "CAP," AS THE SOFTER ROCK BENEATH IT GRADUALLY WEATHERED AND ERODED AWAY.

along one side of a typical valley of the high mountains. From the edge of the smiling, green forest which fills the floor of the valley, the views of the Monument are entirely different from those secured from the higher ledges when one looks down to the valley. The ghostly shapes start abruptly from normal-looking soil and climb for several hundred feet, rank upon rank.

Several miniature canyons reach back toward the cap rock. They are entered from the valley. Echo Canyon, which our party visited with Bill Smick as guide, is the largest and most interesting.

Here nooks and crannies are everywhere. We found a bit of a cave where ice remained after a full summer season which was the driest in years. The edges of the canyon are fluted by the rain waters that rush down over the sides.

At one point there are found four grooves cut almost exactly as though dug by instruments, each nearly equidistant from the next and running from the top of the canyon wall to the bottom. They are channeled by rain-carried sand slicing its way down through the soft lava. They suggest that a quarry master of a giant race here started to cut building stone on a grand scale, but abandoned the task.

In traveling up Echo Canyon one hitches along on his chest and stomach over rough rock surfaces, scrambles up or down slopes of insecure lava, or twists and crawls through little crooked passageways under tons of rock wedged above. There is little normal going. In the floor of the canyon, among other things, we found a rock, about twelve feet across, so cut up by the elements it looked much like a giant stone cauliflower.

North of Echo Canyon, which is about a third of the way north from the Monument's southern boundary, are the "Lost Souls."

"And as I gazed upward, round the stony heights,

On the left appear'd to us a troop

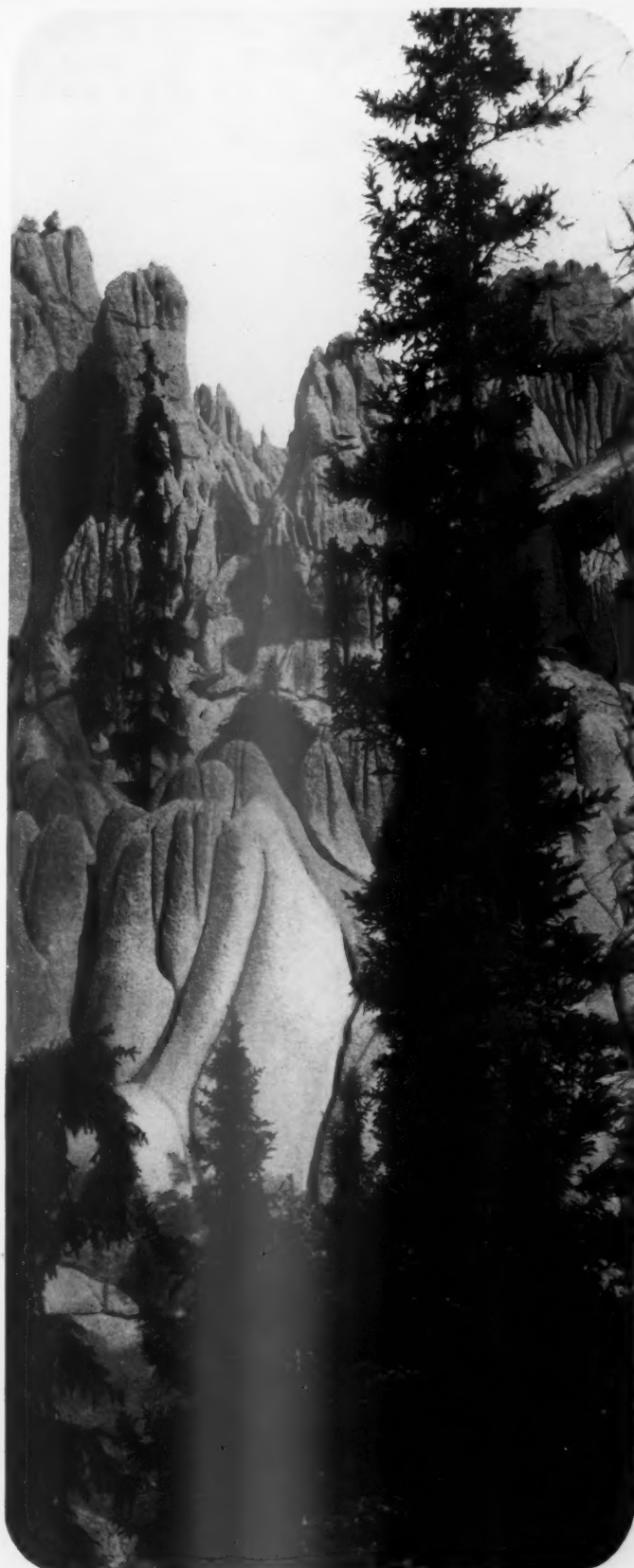
Of spirits, that towards us moved their steps;

Yet moving, seem'd not, they so slow approach'd."

This band of rock forms all bow toward the highest cliffs. They resemble a gathering of many people, each draped in dust-gray shroud. Above is the flame-tinted crest of the Monument.

But a little distance from the "Lost Souls" stand the "Ghosts." They are squattier than the "Lost Souls." Close by are the "Chicken Roosts." This formation is a series of miniature caverns of grotesque shapes. The rocks are colored and the purple tint of the lava shades into black shadows at the back of the "Coops." If there are supernatural chicken inhabitants in these "Roosts," they tuck themselves away in the

(Continued on page 406)



THE "GHOSTS," GLIMPSED THROUGH THE DARK SPRUCES—
"A CONVOCATION OF SCULPTURED SPOOKS"

FIRE WEATHER

By LEWIS EDWIN THEISS

"**S**TUMP and stubble, fire and trouble"—that is the burden of the summer song of the forester as he surveys the stretches of timber under his charge. Is this going to be a day when a single spark will change the peaceful forest into a raging, roaring flame that defies human power to control, or is it to be a day when the duff and dry leaves of the forest floor will be almost fireproof? Perhaps there are fires already burning in the forester's timber—fires in remote and inaccessible parts of the forest, which cannot possibly be reached by a fire crew inside of twenty-four hours. Will they smoulder on, innocuously, until the rangers can reach them, or will they suddenly become devastating conflagrations, destroying thousands of acres of magnificent timber, before they are extinguished by the same mysterious power by which they were so suddenly vitalized?

What is this mysterious force of nature that causes these amazing changes in the inflammability of the forest? And how can the troubled forester know what the day is to bring forth? In his perplexity, he has turned to the

weather man with a plea that the latter tell him when he may expect what has come to be known as "fire weather."

A few years ago we would have explained these peculiar phenomena as "just happening." Today we know several causes of this mysterious alteration in the degree of inflammability of forest material. One of these is relative humidity, another is temperature, another is wind, another is the moisture content of the forest fuels. These factors being known to foresters in a general way at the



Photograph by Ellerman, Pasadena.

WHEN THE CALIFORNIA FIRE LOOKOUT SEES THIS SCENE AT NOON, AS HE SURVEYS THE VAST STRETCH OF TIMBER FOR WHICH HE IS RESPONSIBLE, HE APPREHENDS WHAT IS SHOWN IN THE NEXT PICTURE



Photograph by Ellerman, Pasadena.

THIS IS WHAT HE EXPECTS AT NIGHT—A SKY TORN BY LIGHTNING, SO OFTEN FOLLOWED BY FIRES IN THE MOST REMOTE SECTIONS OF HIS DOMAIN.

present time, the Weather Bureau is now bending its efforts toward the development of a forecasting system that will serve the forester as the frost prediction service serves the fruit grower. The Weather Bureau is trying to develop a system whereby it can warn the forester of the approach of "fire weather."

Fire weather is simply weather with low relative humidity, drying winds, and fairly high temperatures—conditions bringing about a high rate of evaporation. The term relative humidity describes the degree of saturation of the atmosphere. Air that is completely saturated is one hundred per cent humid. When that point is reached it rains, for the air will hold no more water. Air is seldom so thoroughly saturated. Sometimes it is eighty per cent saturated, sometimes sixty per cent, sometimes forty. In deserts and other abnormally dry places relative humidity sometimes falls as low as twenty per cent or thereabout. In some parts of the country anything less than thirty per cent constitutes an important part of fire weather.

But that is not primarily because the air is dry. It is because the dry air dries out the forest débris. The peculiar thing about relative humidity is that the capacity of the air to hold moisture differs at different temperatures. The warmer it is the more water it will hold. If you take zero air that is one hundred per cent humid and heat it to seventy degrees, it will not be anywhere near 100 per cent humid. Yet it will have the same amount of water in it that it had at zero. The amount of water has not

changed. But the capacity of the air to hold water has altered. So, though its actual water content remains the same, it is not so humid *relatively*.

Another peculiar characteristic of the air is that it absolutely demands moisture. When the moisture supply in the sky falls low, the air gets its moisture out of things on the earth—from human bodies, from trees and plants, and from the forest débris.

Experiments have been made at the Forest Experiment Stations which show that forest fires usually do not spread when the relative humidity is 60 per cent or greater. With the air 40 to 50 per cent humid, they tend to flare up. When the air is less than 30 per cent moist the tiniest blaze may become an uncontrollable, devouring conflagration.

The effect of these atmospheric changes upon the inflammability of forest material is amazing. Messrs. J. V. Hoffman and William H. Osborne, Jr., of the United States Forest Service, have shown how the fire hazard varies from hour to hour, in accordance with the relative humidity of the air. Fern, fireweed, and pearly everlasting were tested for moisture content through the hours of the day and night to ascertain how closely atmospheric dryness was reflected in the inflammability of these growths. For these are the materials in which spring fires spread in the forests which were under observation. The percentages given were based upon the dry weight of the materials at 110 degrees F. and 10 per cent humidity.

The fern contained 112 per cent of moisture at 5 A. M., when the relative humidity was 87 per cent. At 8:15 A. M. it contained 20.8 per cent and had reached the inflammability point, while the humidity had dropped to 38 per cent. From 8:15 A. M. until 6 P. M. the moisture content was below 20.8 per cent and consequently the fern was highly inflammable, especially between 11 A. M. and 3 P. M., when the relative humidity fell to 20 per cent and the fern moisture reached 11 per cent. When the humidity began to rise at 3 P. M. the moisture content of the fern began to increase. At 6 P. M. the humidity had increased to 41 per cent and the moisture content of the fern had passed beyond the inflammability point. Consequently the fire hazard in the fern ended at 6 P. M.

Different materials do not absorb moisture at the same rate, so that, though all the material tested reached the inflammability point at about the same time, the fireweed and pearly everlasting re-absorbed their moisture much more slowly than did the fern, and hence remained a fire hazard longer. In the pearly everlasting the fire day did not end until 7 P. M., while the fireweed was inflammable until after 9 P. M.

It is obvious that it would be of incalculable aid to the forester if he could know when there will be periods of very low humidity. Then he would know when to be prepared for the worst. And as his knowledge of the relative inflammability of various kinds of forest debris grew, he would know better and better how to direct his fire-fighting forces.

There is another form of weather that is of great importance in the forest and one which is now being studied by the Forest Experiment Stations through the lookout system of the National Forests of the West. That is the thunder storm! In the East, thunder storms do relatively little harm to the forests. But in the great timberlands of the far West lightning in some regions is the cause of about

42 per cent of all fires. For years past the Forest Service has very carefully charted all fires in the forests resulting from lightning, with the amazing result that lightning belts are revealed. There are certain areas where, beyond question, lightning storms occur in far greater numbers than they do at other points in the same forests and mountains. This knowledge is of great help to the foresters in stationing their fire crews. When the Weather Bureau

is able to give the forester notice of these local thunder storms long enough in advance so that he can make adequate preparations, a great step forward in forest protection will have been taken.

The reason is this: While the present forest forces are adequate to cope with the ordinary fire situation, they are utterly inadequate to cope with the extraordinary situations sometimes brought about by lightning storms. Ordinarily not so many fires result from a single lightning storm—a few dozens or scores, perhaps. But every once in a while a storm comes that starts fires by the hundreds. There are so many blazes that the foresters cannot get to them all soon enough to snuff them out while they are still relatively harmless.

The water that fell

with the storm has evaporated, and the forest material lost its moisture and become inflammable before the fire crews can reach all the fires. Hence many huge conflagrations result. Given adequate notice of the approach of lightning storms—say, 36 to 48 hours—the foresters could send their men to strategic points, get out supplementary crews, and be ready for emergencies.

It is confidently believed that it will not be long before the Weather Bureau will be giving the forest forces reliable forecasts as to both sorts of fire weather—the approach of thunder storms and of periods of very low humidity—in the same helpful way that it sends frost warnings to the fruit industry. Today frost warnings are very accurate and the fruit industry depends largely upon this



U. S. Forest Service.

IS THE FOREST FLOOR TOO WET TO BURN?

Consult the hygrometer! One end of this newly invented instrument contains rattan. When it is thrust into the surface litter, as here, the rattan soon takes up or gives off moisture in response to moisture conditions in the litter. The degree of warping shows on the dial.



QUEEN OF THE AIR, THE "LOS ANGELES," MAKES HER FORMAL BOW TO TROPICAL FORESTS.

The "Los Angeles" South of the Tropic of Cancer

BY WILLIAM D. DURLAND

Professor of Forestry, University of Porto Rico

WHILE the varied duties of a forester often require his absence from town and city life for more or less lengthy visits to the timbered wilds of unpopulated regions, yet not infrequently it happens that an important worldly event is linked up with the locality of his activities. At 6:12 p. m. on the afternoon of May 4th, the dirigible *Los Angeles*, constructed at Friedrichsafen, Germany, in 1924, and turned over to the U. S. Navy in accordance with the terms of the World War peace treaty, was sighted by the writer rounding a promontory of the Attalaya Mountains, on the western coast of the island of Porto Rico. As sure and steady as the Rock of Gibraltar, and with the confidence of a bird on the wing, it followed the coastline south until nearly opposite Point Algarrobo, where it was picked up, made fast to its mooring-mast on the mother ship *Patoka*, and brought to a place of anchorage in Mayaguez Bay. The novel voyage of 1,400 miles from Lakehurst, New Jersey, to Mayaguez, Porto Rico, accomplished in 31 hours of continuous flight, at an average speed of 46.35 miles per hour, is said to be the longest yet made by any dirigible.

As this short sketch of the visit of the newest and

greatest achievement in 20th century means of travel, to "mañana" land and the home of palm trees and coconuts, is being written, a second landing is being made by the *Los Angeles* in the Bay of Mayaguez, it being the occasion of its return from a cruise, May 6th, beginning and ending at Mayaguez and including eastern Porto Rico and the Virgin Islands.

No human occurrence could be so unique on an island where things of worldly importance never happen as the visit of this airship, which the Spanish-speaking folk refer to as the *dee-ri-hee-blee*.

It is highly probable that the appearance of dirigibles in regions remote from the centers of world activities will, in the future, as their use becomes more practical, be of common occurrence. For the present, such a cruise as the *Los Angeles* is now completing represents one of the important and most interesting events of the day. The people of Mayaguez, Porto Rico, will tell you so; and since they are United States citizens, living on an American island south of the Tropic of Cancer, and the principals in the matter of welcoming the dirigible on its first trip into the torrid zone, it must be recognized and accepted as true.





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FAMOUS OLD LOGGING CAMP BALLADS

THIS ballad resounds with the valorous spirit of the day when supremacy among men and animals was measured in terms of ability to do work—to stand great physical exertion; when competition was the tremendous driving force between logging camps, teams, and even individual men.

BY FRANZ RICABY

II. The Little Brown Bulls

AFTER a tree had been felled and trimmed, and the trunk cut into saw-log lengths, the next move was to snake the logs one by one out of the woods to some point or points along the *travois* or logging road, from where they were hauled in huge sled-loads to the frozen stream and piled on rollways along the banks, there to await the spring thaw and the "drive." The snaking process was accomplished with the help of draft animals—oxen in the earlier days, horses later—and was called "skidding."

To drag bodily through a labyrinthine maze of stumpage, undergrowth, and brush such logs as were commonly met with in those days (in this ballad we see that three of the logs cut a thousand linear feet of lumber!) was no job for weaklings. Animals and drivers alike developed almost uncanny skill in controlling the course of the cumbersome load and at the same time keeping clear of its erratic rollings and lurchings. The animals were commonly "hooked" to the log simply by means of a pair of tongs much like an exaggerated pair of ice-tongs. In the case of the larger logs, however, perhaps such logs as are indicated in this ballad, the business of skidding was facilitated by the use of an implement known as a "go-devil," a short, strong, sled-like affair resembling in form the letter "A," with the runners turned up at its point. The end of the log was rolled upon the cross-piece of this device and secured there by a single hitch of chain; the oxen or horses were attached at the point of the "A."

This is an introduction, though brief, to the game at which the little brown bulls humbled the big spotted steers in a Wisconsin lumber camp one day something over a half a century ago and inspired the famous woods ballad named after them.

The piece resounds with the valorous spirit of the day when supremacy among men and animals was measured in terms of ability to do work, to stand physical exertion. In those days competition between camps, teams, and

even individual men, was a tremendous driving force. One cannot help regretting the ballad "leap" between stanzas 9 and 10; for, although one gets from the ballad as it is a considerable reflection of the spirit in which the contest was waged, there is no word of the battle itself, which must have had its heroic aspects.

According to Mr. Fred Bainter, the singer of the melody given here, the ballad of the little bulls was composed in Mart Douglas' camp on a lake in Sawyer County, Wisconsin, known as Deer Lake, in 1872-73. It was in that camp that winter that the contest was staged; he himself was working there at the time and saw it. *Dictus est!*

The conversation recorded in stanzas 8 and 9 is between McCluskey and Gordon and their respective "chainers," the helpers who adjusted around the end of the log the chain by which the log was held on the go-devil. If one may judge from nick-names, "Yankee Bull" Gordon and "Kennebec" John Stebbin were probably "State of Maine" men, among which class were numbered many of the most capable foremen and skilled woodsmen in Wisconsin during the Golden Age of lumbering. The supreme position of the foreman, in this as in all camp agenda, is indicated in the first line of stanza 10. The "scaler," also mentioned there, was the man, usually a representative of the Company, who measured the "cut." By taking the diameter of a log at its smaller end, with a rule devised for his use, he approximated with astonishing closeness the linear feet of lumber in the log. Though the contest here seems to have been won on the basis of the number of logs skidded, the scaler was apparently involved, perhaps in seeing that the logs ran "three to the thousand."

The appearance of the over-confident but uninformed McCluskey at the close of the day with the championship belt all ready for his supposedly victorious yoke of steers is explained only by the supposition, probably correct, that the contestants had not been near enough to each other during the day to keep tab on each other's haul. An affair

of this sort did not make the day a holiday for the crew by any means. The contestants not knowing each other's scores, and the crew being scattered at work as usual, left the foreman and the scaler the only ones in possession of the actual results. The preparation of the champion's belt reflects another shanty-boy devotion: that which he felt toward the prize-ring and its business. John Heenan, Tom Sayres, John L. Sullivan—such were his gods.

Mr. Joe Bainter, of Gordon, Wisconsin, recited for me the stanzas given here; but, not being able to recall the melody, he sent me to his brother, Fred, living in the same state, at Ladysmith. Fred knew not only this ballad, but

enough others besides to make up for any Joe had forgotten, and then some.

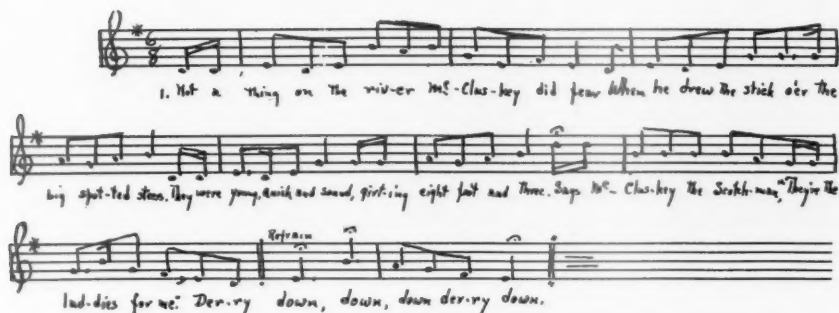
The melody used here has also been given me with a well-known Great Lakes freighting chantey called *Red Iron Ore*. In singing *The Little Brown Bulls* some singers do not include the refrain, but most of them do. It is sometimes given

"Down, down, rye derry down."

When used at all it occurs, of course, at the close of each stanza, though for economy of space it is printed here only after the first and final stanzas.

So much for a fine old ballad of an homeric day.

The Little Brown Bulls



1 Not a thing on the river McCluskey did fear
As he drew the stick o'er the big spotted steers.
They were young, quick, and sound, girting eight foot and three.
Says McCluskey, the Scotchman, "They're the laddies for me."

Derry down, down, down derry down.

2 Bull Gordon, the Yankee, on skidding was full,
As he cried "whoa-hush!" to the little brown bulls.
Short-legged and soggy, girting six foot and nine.
Says McCluskey, the Scotchman, "Too light for our pine."

3 It's three to the thousand our contract did call;
Our hauling was good and the timber was tall.
McCluskey he swore he'd make the day full
And skid two to one of the little brown bulls.

4 "Oh, no," says Bull Gordon; "that you cannot do,
Though it's well do we know you've the pets of the crew.
And mark you, my boy, you would have your hands full
If you skid one more log than the little brown bulls."

5 The day was appointed and soon it drew nigh,
For twenty-five dollars their fortunes to try.
Both eager and anxious that morning were found,
And scalers and judges appeared on the ground.

6 With a whoop and a yell came McCluskey in view,
With the big spotted steers, the pets of the crew,
Both chewing their cuds—"Boys, keep your jaws full,
For you easily can beat them, the little brown bulls."

7 Then out came Bull Gordon with a pipe in his jaw,
The little brown bulls with their cuds in their mouths;
And little we thought when we seen them come down
That a hundred and forty could they jerk around.

8 Then up spoke McCluskey, "Come stripped to the skin.
We'll dig them a hole and tumble them in.
We'll learn the damned Yankee to face the bold Scot.
We'll mix them a dose and feed it red hot."

9 Said Gordon to Stebbin, with blood in his eye,
"Today we must conquer McCluskey or die."
Then up spoke bold Kennebec, "Boy, never fear,
For you ne'er shall be beat by the big spotted steers."

10 The sun had gone down when the foreman did say,
"Turn out, boys, turn out! You've enough for the day.
We have scaled them and counted, each man to his team,
And it's well do we know now which one kicks the beam."

11 After supper was over McCluskey appeared
With the belt ready made for the big spotted steers.
To form it he'd torn up his best mackinaw.
He was bound he'd conduct it according to law.

12 Then up spoke the scaler. "Hold on, you, awhile.
The big spotted steers are behind just one mile.
For you have a hundred and ten and no more,
And Gordon has beat you by ten and a score."

13 The shanty did ring and McCluskey did swear.
He tore out by handfuls his long yellow hair.
Says he to Bull Gordon, "My colors I'll pull;
So here, take the belt for the little brown bulls."

14 Here's health to Bull Gordon and Kennebec John:
The biggest day's work on the river they done.
So fill up your glasses, and fill them up full;
We'll drink to the health of the little brown bulls.

Derry down, down, down derry down.



THE ONE-ROOM, CLAPBOARD CABIN IN THE WOODS NEAR ROME, GEORGIA, WHERE MISS BERRY BEGAN HER WORK WITH TWELVE MOUNTAIN BOYS

Martha Berry—Her School and Her Forest

From the Dream of a Woman, Which Began in a Small Cabin in the Woods, Has Grown a Great Mountain School, Surrounded by an Endowment Forest

BY FRED K. HOEHLER

TWENTY-TWO years ago Martha Berry, a Southern girl, of the mountains of North Georgia, decided that she would give the property, recently deeded her by her father, to establish a school where boys and girls from the rural and mountain South might secure a Christian industrial education.

This decision was not reached impulsively, but was rather the natural outcome of her story-telling tours of the mountain behind Roney, the "Sunday horse," where she came in contact with the mountain people, whose poverty and isolated lives had barred them from the advantages of religion and education—passed by in the march of progress, because they were out of the way.

Miss Berry, inspired by her vision of service, after giving her land went out among friends in the North and East and secured from them the financial assistance

necessary to promote and carry on this unusual work.

The original property included a few hundred acres of flat wood lands in North Georgia, some of which had previously been cultivated in cotton. The balance was covered with old field pine. Occasionally farmers in the neighborhood would become discouraged and want to get rid of their land because it would not produce anything, and on these occasions Miss Berry would put in her own small savings or find a friend who understood her purpose, and through that friend purchase the land for the Berry Schools. This so-called wild land was burned over every year or cleared by the farmers for the sake of securing pasture for their cattle, or growing the only money crop known to them—cotton.

Martha Berry, however, understanding that this land was largely forest land, has allowed it to develop and has

protected the old field pine, so that today her school is surrounded by four or five thousand acres of well-wooded forest land. When asked why she has secured and cared for this apparently worthless land, Miss Berry smiles and replies that some day this land is going to run her school for her.

The story is a simple one,—of a woman with a big heart and lots of vision. She has given her own land and purchased more because she believes that her students will some day, by careful handling and reforestation, develop one of the finest timber preserves in the whole Southland, which will yield a specific annual return, just as money will do when invested in government bonds. She has today a school of 600 boys and girls; in fact, she has three schools. One is for boys who are ready to attend high school; one for girls of all grades, and another for boys who have never had the foundation or grammar school training. This is called the Foundation School, and it is at this place that the real forestry spirit is found today. The 125 boys at the Foundation School are beginning scientifically to cut some of the timber, and one of the recent monthly reports shows a return of a little over one hundred and fifty dollars, with the portable mill running only part of the time, and the work just begun.

Some of the mature timber is cut for use at the Schools and poles, cordwood, etc., are obtained from the thinnings. This takes care of the immediate needs, and Miss Berry insists that all other timber must have a chance to grow until it can be cut and sold commercially, under scientific management. The trees in the Berry school forest are treated with as much respect as the cotton, corn, or other crops on the schools' farm. A crop is to be cut annually at a time when the work of the students and faculty



MARTHA BERRY

Miss Berry is wearing in this picture a homespun dress woven by Berry School girls from Angora wool from goats raised on the Schools' farm

is not so urgently needed on the farms and in the shops. The timber cut in this manner will provide a money crop at a time when farm income is generally pretty thin.

Classes of students are instructed in forestry principles and methods of cutting, by charts and in sample plots. The Forestry Club, a very active organization in the schools, is responsible for the extra-curriculum interest in forestry. A chapel period each term is conducted by the club, whose members speak on forestry subjects before the student body. Never is there a forestry expert of authority in the vicinity of the schools without receiving an invitation from the club to speak before the students. A campaign against forest fires has been carried on with good results in the country surrounding the schools. This is also a club activity.

The schools have started a small forest nursery and will endeavor to raise slash and long leaf pine. Miss Berry believes also, because of the climate in that vicinity, it will be possible to raise white pine—at least she has succeeded in her nursery, and will un-

doubtedly succeed in her woodlot.

As time goes on, Miss Berry becomes more confident that intensive forestry will pay just as adequately as intensive farming has paid the Berry Schools. Neighbors hardly understand the program which Miss Berry has ahead, but their children will find that, through the Berry

Schools, timber has been saved for all of North Georgia, and their own timber land made more valuable through the influence which the Berry Endowment Forest will surely have.

Indicating the outstanding importance of this work of one woman, who has given herself to the realization of a dream, and that it is nationally recognized, is the fact that Miss Berry was presented with a

(Continued on page 412)



PRIDE OF THE BERRY SCHOOLS

This is a woodlot of "old field pine"—and there are five thousand acres like it in the "Endowment Woodlot"

ARE THE FORESTS OF AMERICA WORTH SAVING?

Lumbermen, paper manufacturers, railroad executives, water power presidents, and others whose livelihood and prosperity come from industries based upon the manifold products of the forest say "YES."

Fishermen and hunters who want to see their sport perpetuated and who know that the preservation of wild life and inland fisheries really begins with the preservation of the forest say "YES."

Out-door people who love the natural beauty of these United States and who realize that our forests are the fountains of outdoor beauty and enjoyment say "YES."

Public spirited men and women who want to pass on to our children this country no less beautiful and no less productive than we received it say "YES."

In short,—ALL THINKING PEOPLE SAY "YES."

All right! Let's begin where the beginning is most needed to save the woodlands of America, which mean so much spiritually, socially and industrially to all the people of all the States.

IT HAS TO BE DONE AND NO ONE PERSON IS GOING TO DO IT.

There is just one agency that can do it. We will tell you about that later. First, let us get the main task clearly in mind.

While you are reading these words, forest fires are burning in many different States in this country of ours; are blotting out acres of green forests. Here is the picture of the average forest fire year in the United States painted recently by an authority on the subject:

Our present achievement in the forest-fire line being 50,000 fires and 10,000,000 acres burned over, we are averaging 200 acres to the fire. Each, then, averages two-thirds of a mile in diameter. Lining up the 50,000 so they touch, they extend 32,784 miles; so each year we run ten lines of forest fire, each two-thirds of a mile wide, across this country from coast to coast; and if we cut out the prairie and farm country, keeping these lines in the woods, it will not take very strong winds to drop sparks anywhere between them.

If riot or invasion should sweep this country, killing unprotected settlers, plundering banks and treasuries of \$100,000,000 of the people's savings and business capital, and, by destroying the basis of commercial enterprise, reduce our income by hundreds of millions more, the catastrophe would startle the world. If this disaster should threaten to recur the following year and every year thereafter, annually taking half a billion dollars from our

people, paralyzing our industries, threatening future famine, and, worse still, destroying by millions of acres the very productivity of our lands, *which alone can avert it*, the situation would be unbearable. It would dominate every mind. All else would be forgotten in preparation for defense.

Such a parallel is fair. Although less spectacular, forest fire destruction is as real as that of such a riot or invasion. And it is more far-reaching in effect on future prosperity. So far, we have pictured only its current sacrifice of wealth, life, and happiness.

There remains to be appraised and faced its sinister threat against every forestry step this Association advocates, every purpose of forestry reform, every forestry investment, whether private or public; every attempt to assure this country a wood supply or to keep its forest land surface a sustaining national asset.

TEN MILLION ACRES of land blackened by the tongues of fire every year! **ONE HALF-BILLION ACRES** every fifty years—an empire considerably greater than the total area of forest land in the United States. No wonder we exclaim:

"IF WE ARE TO HAVE FORESTS THEY MUST BE PROTECTED FROM FIRE. WE CANNOT BURN OUR FORESTS AND HAVE THEM TOO."

Is it not full time to make the American people see and understand this menace of **FOREST FIRES**, to the end that they will expel it as they would expel an armed invasion? Unfortunately, our national propensity to "Let George do it" finds expression here in "Let the Lumbermen do it"—or "The States should do it"—or still again, "It is the task of the Federal Government."

It is **NO** one man's work. It is the work of **ALL** men—

Because forest fires touch **ALL** interests. They destroy not merely present timber growth, but the tender little trees of today that if saved will make homes for our children tomorrow. They paralyze local industries; they destroy local hunting and wild life by killing game and devastating the breeding places of birds and wild animals. They pollute running streams and by destroying watersheds, dry up our small water courses, robbing our rivers and lakes of fish, pure water and hydro-electric power. They undermine by millions of acres the productivity of our forest soils upon which the nation must depend for its future wood supply and its great hinterland of outdoor recreation; in short, they despoil **OUTDOOR AMERICA** and all that it means in the work and play and health of the nation.

And touching all interests, it is for progressive men and women—leaders representing all interests—to join hands in making war on forest fires. Individual efforts are not enough. They are too sporadic; they lack the systematic year-long attack that is necessary to drive the **RED DRAGON FROM OUR WOODS**, and blot out its trail of 50,000 fires every year with green growing forests.

"How," you ask, "do the 50,000 fires START which are ravaging our woodlands every year?" Ninety percent of them are started by the hand of man due to carelessness and ignorance of the menace of forest fires. With the population of the United States on the increase and the automobile taking more and more fire-ignorant people into the country and into the forests to enjoy hunting and fishing, to hike or to rest, forest fires are becoming an increasing menace.

This increasing horde cannot be stayed. Theirs is the right to go forth into our woodlands in search of labor, rest or pleasure. We encourage them to do so, with good roads and other conveniences—and it is right that we do for it makes better men and better women. The great American out-of-doors is for use, but if through ignorance, our use destroys it with fire, what of the morrow?

This brings us to the one agency that can save our woodlands from destruction—"POPULAR EDUCATION"—the creation of a public opinion that will banish the national habit of "letting our forests burn." If we are to have forests, the American tradition which considers a forest fire an irrelevant occurrence must be broken. Apathy and ignorance on the part of the public in respect to forest fire, as a community, state and national menace, must be dispelled. The American citizen must be made forest fire alert while out of the forest as well as in it. He must be made to see that in a forest fire there is not merely the destruction of merchantable timber but likewise the destruction of young, growing timber, of gainful employment, of taxable property, of soil fertility, of water supply, of wild life, and of out-door recreation and scenic beauty. Into every American man, woman, and child there must be instilled, through popular education, an appreciation of forests and forest land use so broad and personal that care and protection will become a natural instinct.

That such an educational campaign is the most immediately important factor in keeping up the great American out-of-doors and assuring the nation future forests is now widely admitted. Recognizing this fact, The American Forestry Association has undertaken to raise a special fund to be used for popular forest education, directed primarily against public forest-fire ignorance. It plans a three-year campaign and will raise FIFTY THOUSAND DOLLARS annually for its operation. It is appealing DIRECTLY for the cooperation of public spirited individuals and organizations in this project.

The Project

The object of the project is the *creation of enlightened public sentiment in respect to the evil of forest fire*, through localized cooperative effort, this to be so thoroughly grounded upon intelligent appreciation of the value of forests and forest management that adequate state and national forest laws and customs will follow by the force of public demand. While the first object, therefore, is public education, the ultimate object is public *action*, which will assure the forest protection best adapted to local, no less than

national, needs. The work will be effected through a sane, well-directed plan of cooperation, in which local and national organizations and publications will participate and aid in adapting the educational material directly to state and regional needs. Working through local organizations, it will be possible to "tune in" the educational work directly for the advancement of specific state and national forest policies, accepted by common judgment as best calculated to meet state needs.

The Budget

The working budget has been set at \$50,000 a year for three years. A portion of this annual budget will be used in providing a working organization which would be available for cooperating with state and regional organizations in determining the educational material most needed locally; furnishing help, particularly to those states most in need of help, in formulating state forest protective policies and in crystallizing their need in the public mind.

The remainder of the budget will be available for the preparation and printing of the specific type of educational material found to be most needed in different regions and by different organizations. Through a widespread use of localized educational films, lectures, and other forestry material in the public schools, boy and girl camps, rural communities, women's clubs, civic and commercial organizations, etc., the campaign would thus be brought down to specific regional conditions, stressing most particularly local problems and local needs.

Consideration of a budget of \$50,000 annually for three years, in relation to the work contemplated should take

into account that the cooperation which will be obtained gratis from public spirited individuals and organizations throughout the country will make it possible to more than treble in educational promotion every dollar spent in organization and preparation of the material. And the work set in motion during the three year period will continue through the years to follow by the force of the public interest it will arouse.

While the principal objective of this campaign of education will be to stamp out forest fires, we would not have you think that the work will be limited exclusively to that evil. Popular education which will make the American people forest-minded must be based upon a broad understanding of all forest questions. The instruction which will strike deepest at forest fire is the instruction which gives our children and our "grown-ups" a proper understanding of forest culture in all its bearings upon their lives, and a quick appreciation of the necessity of trees and forests in the life of the nation today no less than tomorrow. This is the broad campaign which the Association has planned.

Plans

Here are some of the things which the project contemplates:

1. Making widely available existing and new sets of motion pictures depicting in graphic and popular way what forest fire means as a destroyer of forest, wild life, water, recreation, etc.
2. Preparation and distribution of sets of lectures, both with and without slides, adapted to specific and regional use in much the same way as the motion pictures. These would be for the use of schools, clubs, organizations and individuals now expressing a desire to help in the cause of popular forest education.

3. Printing and distribution of forest fire posters, envelope stuffers, and stickers, to be used by the many individuals and agencies now interested in promoting popular education in forestry and forest fire prevention.

4. The compilation of a popular pamphlet on forest protection for use by the schools, the boy and girl scouts, game and outdoor organizations. This booklet would be designed not only to inform the reader how to prevent and combat forest fires, but would give him a broader vision of the whole realm of forest conservation.

5. Preparation of systematic reading courses and forestry day programs for women's clubs and other organizations. There is a great demand for material of this kind.
6. An annual series of oratorical and essay contests promoted by the offering of prizes in the public schools, especially in the public schools of the timber land sections of the United States.
7. Preparation and distribution of current literature and pamphlets especially designed to aid the school teachers of the country in teaching lessons in forestry to their children.
8. Employment of several foresters and lecturers to study and prepare educational material needed in states which are inactive or mildly active in forestry, and to assist and stimulate local clubs and organizations in planning and carrying on educational work.

Approval

Col. William B. Greeley, Chief Forester of the United States:

"The prevention of forest fires is, in my judgment, basic to our whole conception of forest conservation, whether we view it from the standpoint of conserving the remaining supply of timber, of inducing young forest growth, of protecting streamflow, of restoring wild life, or of promoting opportunities for outdoor recreation. Until the loss from forest fires is materially reduced, however, none of these efforts for forest conservation can be soundly developed because their fundamental basis is insecure.

"I am, therefore, very much in sympathy with the project of The American Forestry Association for conducting a large-scale educational campaign over a number of years to get at the roots of this evil in public indifference or misconception and create a new attitude by the American people toward their forests. I do not know of any way in which money could be more effectively spent at the present time than through a project of this nature."

Gifford Pinchot, Governor of Pennsylvania:

"If we are to have forests, and we must have them to remain prosperous, they must be protected from fire. Adequate forest protection is the first essential in forest production, for without it, as has been fully demonstrated in America, forests will be burned up more rapidly than they are produced. You can't burn forests and have them too."

E. T. Allen, Forester of the Western Forestry and Conservation Association:

"Our problem is not a fire-hunt but a man-hunt; before the fire if possible, but in no case abandoned until he is eliminated. Not fire, but the owner of the hand that lights it, is the public's enemy. In his heart, and that of his wife and child and neighbor, and of the officer of the law and the judge on the bench, and of editor, legislator, and man on the street, there must be the knowledge that his hand has been set against society as surely as that of the pervert, the killer and the thief."

The Start

The plan has already been submitted to Mr. John D. Rockefeller, Jr., who has started the project on its way by pledging Ten Thousand Dollars annually for the three-year period, provided the annual budget of Fifty Thousand Dollars is raised. With this substantial beginning we have faith that the friends of the forest will leap to the call and help to raise the remaining amount. The American Forestry Association stands for the common cause and provides the common meeting ground. If each reader of this appeal accepts **INDIVIDUAL RESPONSIBILITY** for getting behind the project and helping to make up the budget, **SUCCESS WILL BE ASSURED**. **HERE** is the greatest opportunity ever offered to individuals and organizations to contribute to and participate in a tremendous and necessary service in behalf of more forests for this and oncoming generations and a better outdoor America for all time.

WE ARE GOING THROUGH WITH THIS PROGRAM. Your support is needed. Send in your pledge—no matter how small. It will help. It will encourage others to do likewise. It will identify you on the honor list of men, women and organizations who recognize the need of teamwork if America is to be kept clothed in the beauty and beneficence of green forests.

Your contribution or pledge should be mailed to The American Forestry Association, 1523 L Street, Washington, D. C. If you cannot send money now, simply pledge the annual amount you are prepared to give when called on.

The American Forestry Association,
1523 L Street, N. W.,
Washington, D. C.

In support of your educational campaign to stamp out **FOREST FIRES** I hereby contribute \$..... or pledge the amount given below for the years indicated; each annual payment to be made when called for during the year for which it is pledged.

1926..... (\$.....)

1927..... (\$.....)

1928..... (\$.....)

(Signed).....

Street.....

City.....

Date..... State.....

Native Flowering Evergreens

By L. E. MANNING

A PARTICULARLY fascinating class of native shrubs are those that, in addition to a gorgeous show of bloom in summer, retain their leaves during the winter—flowering evergreens, in other words—and the list of such varieties is surprisingly lengthy, especially south, with a wide range as to color, time of bloom, and character of leaf.

While noticeable in the mountains from Georgia to Pennsylvania, but especially from there to the South Atlantic and Gulf seaboard, these varieties are plentifully distributed over many states and can be successfully transplanted and grown. The hardier mountain kinds can be grown in the northeastern states, a few even in Maine. Most of them are easily collected—if you know where to look—or can be readily secured from any reliable nurseryman.

Many of the varieties of broad-leaf evergreens—as well as the native Azaleas, which are not evergreens—are ericaceous and special soil conditions are necessary for best results—namely, a light humus or decayed vegetable soil, rather damp and “sour.” Many amateur gardeners busily fighting sour (acid) soil conditions might pause to reflect that others less fortunate must spend time and labor to prepare their land before adding these varieties to their collection of living *objets d'art*. Such fortunate ones could do worse than use ideal acid soil conditions ready to hand for planting some of these splendid varieties.

Rhododendrons in particular will thrive best planted in the proper environment. For range of color and size of bloom, native Rhododendrons are not as effective as the

horticultural varieties—the Hardy Hybrids. These latter are generally denser and more dwarf in growth and bloom more freely. Native Rhododendrons are, however, unsurpassed for foliage effect and large plantings usually consist principally of native varieties, with the Hardy Hybrids used as a facing and to add decorative value. Both are hardy and require no protection for general planting.

Very many flowering evergreen shrubs are easy of culture and give satisfactory results when planted in any average good soil. The Mountain Laurel (*Kalmia latifolia*) will succeed in any location, provided the ground does not dry too easily. It flowers better if not planted in full sunlight, but in partial shade. The mass of pink shell-

like flowers (and large decorative buds for weeks before blooming even commences) together with its pleasing foliage, make this variety justly popular. An extreme test of its adaptability might be mentioned where laurel was planted in ground that had been filled in with ashes and building refuse with a thin layer of top soil. This planting, to the writer's knowledge, has



Courtesy J. N. Hoff, Esq.

FEW OF OUR NATIVE FLOWERING EVERGREENS CAN BE USED WITH MORE STRIKING EFFECT, EITHER IN GENERAL LANDSCAPE USE OR AS BASE PLANTING, THAN THE RHODODENDRON. ITS BEAUTY LASTS THE YEAR ROUND—STRONG, HANDSOME EVERGREEN FOLIAGE IN WINTER, AND A REAL GLORY OF BLOOM IN EARLY SUMMER

bloomed successfully for its third year and suffers only slightly from burned leaves.

Lily-of-the-Valley Shrub is a common name for *Andromeda floribunda* and best describes its bloom—thickly clustered white bells on half-drooping branches. The leaves are large and glossy green and in autumn turn a rich bronze, very attractive against other evergreens, as it is comparatively low-growing. It will thrive in full sunlight or in partial shade, a valuable point when con-

sidered as material for planting around house foundations.

Drooping Leucothoe (*L. Catesbaei*) is similar in bloom and foliage, with the added advantage of a more pronounced drooping effect. Some authorities refer to this as one of the finest evergreen shrubs of native origin.

Azaleas, so far as native varieties are concerned, cannot be called evergreen in the more temperate parts of the country. There are, however, two highly satisfactory evergreen Azaleas, both of them Japanese—*Amocna*, a light purplish red, and *Hinodigiri*, a brilliant crimson. So free blooming are both of these that it is quite impossible to see anything but flowers during the early weeks of May. These fine varieties thrive in any good soil and in full sun-

light. The *Hinodigiri* is particularly attractive in winter, when its leaves turn a glossy golden bronze.

The charm of the Garland Flower (*Daphne*) appeals to sight and smell. No rockery or low border lacking this variety could satisfy the tastes of those who are acquainted with it. Hardy, easy of culture, with unique foliage and bloom; its fragrance suggests that of the Narcissus.

The accompanying table will be of interest to those who wish to go further into the subject, although only a few of the better known varieties are listed—those most easily secured and cultivated. All these do best in at least slightly acid soil, rhododendrons and heather requiring more acid.

(Variety)	(Common name)	(Height)	(Time of bloom)	(Color)	REMARKS: H—Hardy; B—Stands full sun; S—Thrives in shade; A—Prefers acid soil; G—Any good soil.
AZALEA					
<i>A. Amocna</i>	Evergreen Azalea	2-3 ft.	May	Light Purple	HBG—Leaves small and box-like.
<i>A. Hinodigiri</i>	Japanese Azalea	2-2½ ft.	May	Bright Crimson	HBG—Extremely brilliant bloom.
<i>A. Indica Alba</i>	White Indian Azalea	3-4 ft.	May	White	SBA—South of New York.
ANDROMEDA					
<i>A. Floribunda</i>	Lily-of-the-Vally Shrub	2-5 ft.	May	White	HSBG—Dense and many branched.
COTONEASTER					
<i>C. Horizontalis</i>	Cotoneaster	2-3 ft.	July	White	HBG—Small glossy round leaves and red fruit in winter.
DAPHNE					
<i>D. Cneorum</i>	Garland Flower	1-1½ ft.	May	Pink	HBG—Flowers very fragrant.
HEATHER					
<i>Calluna Vulgaris</i>	Scotch Heather	1½ ft.	August	Pink	HBG—Small blooms in long racemes.
LAUREL					
<i>Kalmia Latifolia</i>	Mountain Laurel	5-10 ft.	June	Pink-rose	HSG—Needs moisture—free bloomer.
LEUCOTHOE					
<i>L. Catesbaei</i>	Drooping Leucothoe	3-4 ft.	May	White	HSBG—Leaves turn rich bronze in autumn.
RHODODENDRON					
<i>R. Maximum</i>	Great Rosebay	8-10 ft.	June and July	Rose	HSBA—Leaves 4 to 6 in. long.
<i>R. Catawbiense</i>	Catawba Rhodo.	6-8 ft.	June	Purple	HSBA—Leaves dark shiny green.
<i>R. Catawb. Hybrids</i>	Hardy Hybrid Rhodo.	3-8 ft.	May and June	All colors	HSBA—Many fine named varieties.

The Gem Grotesque of American Scenery

(Continued from page 393)

deeper shades of the shadows, so no mortal has seen them; but the spirit of a stone "Ghost" may know how to catch them.

Besides these unusual natural features, the place has historical interest. Near a spring of clear, pure water, which is now improved to serve the modern visitor, are bits of almost completely rotted pack-saddle equipment and the whitened skeletons of several mules. These are said to have been part of General John C. Fremont's outfit, abandoned here in 1848.

Captain George M. Wheeler, U. S. A., in 1874, under orders of the War Department, led an expedition of exploration into this part of Colorado. The Monument is named in his honor. It was proclaimed a reservation of this class by President Roosevelt, December 7, 1908. It was established because it is an " . . . area of unusual scientific interest, as illustrating erratic erosion."

To ramble through this Monument is an extraordinary

experience. The most awesome, gigantic Hallowe'en spectacle ever produced could be enacted if only movement could be given to the strange and supernatural forms gathered here. But rock bodies restrain those spirits which may lurk in the singular formations, and unless some super-inquisitive tourist discovers how to break the spell or to command the genie that guards the place, generations will see the "Lost Souls" still bowing toward the flame-colored cliff, the fat-bodied "Ghosts" near the "Chicken Roosts," and most of the crown rocks still balanced on the pillars, which have grown taller as the surrounding rock has shrunk away under the cutting lash of wind-driven rain.

Probably no natural phenomenon exists with scenic and scientific features similar to those of the Wheeler National Monument which is so little known. It is the scenic "gem-grotesque" of western America.



KEECHELUS LAKE RESERVOIR SITE IN WASHINGTON

A natural lake, whose storage capacity has been increased and protection from silting improved by being included in a National Forest.

Forests and Waters

By F. H. NEWELL

Formerly Director, United States Reclamation Service

IT IS a somewhat curious circumstance that our national forest policy was originally urged or initiated perhaps more largely by the belief that forests had a beneficial effect upon water than upon the needs of the country for an adequate supply of timber. A review of the early arguments for the establishment of national forests and for the purchase of forested lands in the Appalachian Mountains brings out that the arguments most effectively used were, for the most part, those which had to do with the influence which forests have upon the waters of the country. Almost every popular orator on the subject of forest protection referred habitually to the streams and pools which he knew as a boy; he described in eloquent terms the natural beauties of these places, contrasting them with the destruction which had taken place since the trees were cut. He argued that the cutting of the trees had been followed by the drying up of the streams, the destruction of the fishing, and the disappearance of the old-time swimming holes.

This powerful factor in the adoption of national forest policies arose from the conviction that the forests have a very definite and beneficial effect upon stream flow. Arguments were presented again and again in committee and in Congress to the effect that it was unconstitutional to utilize Federal funds in the purchase of forest lands in the Eastern States or to create national forests on lands which the Government did not still own. This constitutional objection was overcome by arguments based upon the interstate commerce clause of the constitution. It was asserted that the Congress had a duty to maintain the navigable streams of the country, that it was necessary not merely to remove snags and sunken logs, but also to dredge out the channels and, more than this, to prevent the filling in of the navigable channels; also that this filling

in of the channels could be best prevented by going to the headwaters or to the lands from which the mud and sand was washed into the stream and there make such provisions as would hold this soil in its proper place.

The retention of the soil on the lands at the headwaters of navigable streams, it was urged, could best be brought about by maintaining a forested condition. Moreover, it was argued that the forests exerted a beneficial effect not merely in preventing erosion of the surface soil, but in helping to modify the floods by holding back the water from the rains. This water, soaking the heavy cover of decaying leaves and twigs, which form the mulch on the forest floor, was given out slowly and contributed to the maintenance of the low water flow.

Foresters generally, and, in fact, nearly all persons familiar with conditions in mountainous regions, are strong advocates of the theory that the forests do exert a protective value; first, as binding the soil, covering it with humus and litter, thus preventing its erosion; and, second, as exerting a modifying effect upon the flow of streams because of the fact that rainfall upon the floor of the forest is largely absorbed by the spongy material.

There is little doubt, in the popular mind at least, that in this way the forests reduce the magnitude of floods, tend to maintain stream flow, through springs, in dry weather and, perhaps most of all, by preventing erosion of land which they occupy, they reduce the amount of

Report to the Legislature of California on Senate Concurrent Resolution, No. 27, regarding erosion and flood problems of California, 1923, 165 pages and plates.

Forests and Waters, in the Light of Scientific Investigation, by Raphaël Zon, from the final report of the National Waterways Commission. S. Doc. 469, 62d Congress, 2d session.

What the National Forests Mean to the Water User, by Samuel T. Dana. U. S. Forest Service, 51 pages and plates.

The Relation of Forests and Water, 5th National Conservation Congress, 1913.

silt carried by streams, and lessen the damage done by flood waters wherever these may inundate or erode fertile fields.

It was recognized that the prevention of erosion and the maintenance of good conditions of the stream flow was dependent not wholly upon the maintenance of the forests in an untouched condition but upon the preservation of the bushy growth or smaller shrubs; thus the wooded lands had value with reference to the conservation of water supply irrespective of whether the larger, ripe, or mature trees were taken out; provided that in removing these trees the smaller growth was not destroyed or burned over, exposing the bare soil to the beating and erosion of the rains.

While in the minds of most of our citizens and voters there is little doubt as to the beneficial effect of a forest growth upon water supply, there is not complete agreement, as to the extent of these benefits, among the carefully trained observers and scientific men of the country. Some have even gone to the extent of arguing that more water might be had if the trees were all cut off. They hold that the evaporation from the enormous area of

foliage of a large tree results in the pumping of large quantities of water out of the soil and putting it back into the atmosphere; also, that on the mountains, if no trees are present to hold the snow, it is blown into the gulches or depressions, where it forms solid snow banks which, slowly melting, add to the summer flow of the stream, whereas in the forests the snow lodges on the trees and is evaporated into the air without melting.

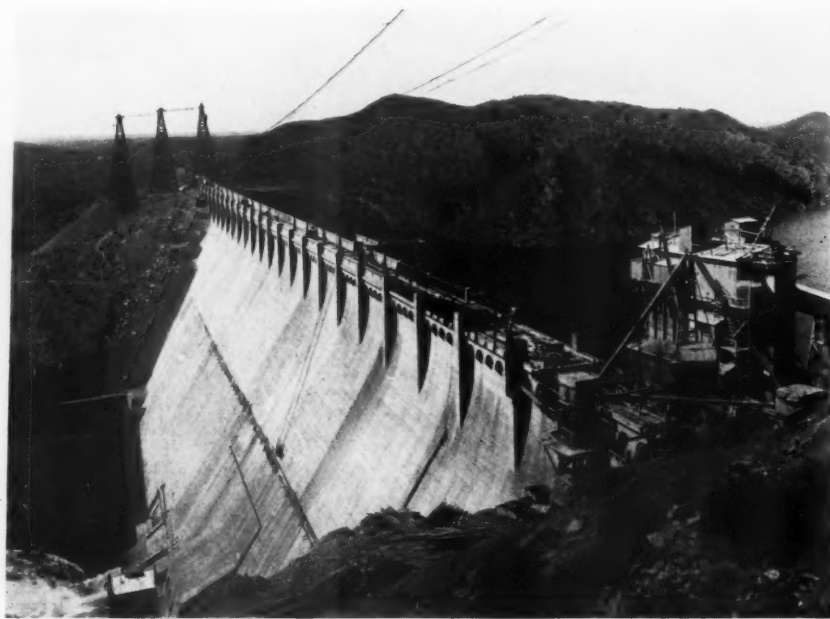
Each advocate of this or that theory may be right in part and each equally wrong. This is because each is talking about something quite different from that in the mind of the other man. The forests and the soils or rocks from which they grow, also the rainfall and its effect upon the soil, are widely different in Maine or in Michigan from those in the Southern Appalachians. Conclusions drawn from the study of the northern part of the United States

are quite erroneous if applied to forested or denuded lands in the South, especially in the southern Piedmont region or in the Sierras. Each part of the country has its own peculiarities of soil and rainfall, and it would be as unwise to draw general conclusions about the forest cover or lack of cover as it would be to assume that, because the people in Montana are most comfortable wearing fur overcoats six months of the year, therefore the people in all parts of the United States should do so.

However, in one sense we can well afford to let these people argue on the details of the exact effect of forests on water flow because these differences seem to arouse interest and in the end practically all will agree that for all other purposes the forests should be maintained and be used as dictated by experience, not only for the production of timber, but also as shelter for the wild game

and for the birds so necessary to the success of the farm and, wherever accessible, as affording opportunities for outdoor recreation.

In a recent paper on *The Influence of Forest Cover on Stream Flow*, by H. T. Gisborne (delivered before the Montana Irrigation and Drainage Institute, December 17, 1923), it is stated that



ELEPHANT BUTTE DAM, NEW MEXICO—CREATING A RESERVOIR ON THE RIO GRANDE, 100 MILES ABOVE EL PASO, TEXAS. STORAGE CAPACITY IS BEING RAPIDLY REDUCED BY EROSION OF SOIL FROM THE UNFORESTED DRAINAGE AREA.

conclusive proof of the effect of forest cover on stream flow cannot be given. Many experiments have been made but the fact still remains that every man must use his own judgment in determining the conclusions. It appears from studies made in California that the water-holding capacity of the soil was reduced by fire by about 40 per cent in one particular case. Other experiments in Colorado indicated that where local rains fell on impermeable soil the highest stage of flood was attained within six hours of the start of a rainstorm, while on the forested areas high water was reached from 18 to 48 hours after the storm began and with correspondingly reduced damage.

Many measurements have been made in European countries confirming the belief that in a forested area, as contrasted with open country, there was a gain of upwards



McDERMOTT LAKE RESERVOIR IN GLACIER NATIONAL PARK, MONTANA. HERE THE FOREST GROWTH IS ALSO PROTECTED, AND SILTING IS AT A MINIMUM.

of 20 per cent in the amount of water penetrating the soil, so that the conclusion is reached that in a region of forests the tree growth serves to create in its action on the soil a natural reservoir doing the work of dams or artificial lakes in conserving the water supply.

The latest attempt as yet made by the United States Government in securing accurate data is that being carried on at Wagonwheel Gap, Colorado, where two small drainage basins of about 200 acres each lying side by side at equal elevations have been studied continuously since 1910. After obtaining records of stream flow and silt deposit from each basin for eight years, one of these drainage basins was completely denuded and is being kept clean by annual burning. It is too early as yet to draw definite conclusions, but the preliminary results indicate that the forest cover has a marked influence in preventing soil washing and erosion and in regulating flood flow.

The cover on the forest floor, if preserved from fire, becomes, as before stated, a natural reservoir, its tendency to regulate the stream flow being widely recognized. This condition, however, does not wholly obviate the necessity for artificial storage of water, particularly in or adjacent to the arid regions where land values are directly dependent upon the adequacy of water supply for artificial irrigation. As the country develops, practically every mountain valley which can be converted into a lake at reasonable expense should be thus used and all of the small natural lakes should be increased in area and capacity by building suitable dams or regulating works at the outlet.

The lands surrounding these natural or artificial reservoirs should be maintained as far as possible in a forested condition in order to prevent the erosion of the soil and its washing into the reservoir. Even if the conditions are such that forest trees or the larger growth does not flourish, yet it is possible to encourage the smaller herbage which tends to hold the soil. It is to be noted in this connection that in these relatively dry regions the rain, when it does occur, usually comes in sudden, sharp downpours, commonly known as cloudbursts. The destructive effect of these may be greatly modified if the vegetation is preserved.

The question to be decided by the engineer and economist is as to the investment which should be made in maintaining the forests or in replanting denuded lands tributary to a reservoir. If by neglecting the watershed the effective life of a reservoir, whether for city supply or hydroelectric development, is reduced from 80 years to only 40 years, it is evident that the value of the investment will be correspondingly reduced. According to Mr. W. W. Ashe, inspector of the United States Forest Service, excessive erosion is unnatural and can be prevented at a cost usually within the limits of prudent investment, more especially as much of the cost of protecting the forests or even of reforestation is covered by the value of the timber cut as well as by the improved condition for the reservoir.

The time is rapidly approaching when public opinion will demand the filtration of all waters used for household or municipal purposes. This large expenditure, however,

(Continued on page 424)



Courtesy National Park Service.

THIS NEW ROUTE, LEADING FROM THE SOUTH RIM DOWN TO THE COLORADO RIVER AND FROM THERE UP TO THE SPECTACULAR NORTH RIM AND THE ADJACENT KAIBAB FOREST, IS KNOWN AS THE KAIBAB TRAIL

The New Trail Into the Grand Canyon

*Being the Second Chapter in the Fight for Bright Angel Trail.
The First Appeared in the June, 1924, Issue of this Magazine*

THE famous Bright Angel Trail, leading down into the Grand Canyon, is still a toll road and thereby hangs the story of a new trail that soon will open new vistas to the thousands who yearly "drop off" into America's greatest wonderland. Congress last year, after a prolonged disagreement and many heated discussions, finally made available an appropriation of \$100,000 to purchase Bright Angel Trail from Coconino County. A year earlier an agreement had been reached with representatives of the county to sell the trail for this sum. With the money available, and this agreement already made, the transfer of the trail from the county to the Federal Government seemed assured. But immediately difficulties arose.

After various delays and discussions the Board of Supervisors of Coconino County, by a vote of two to one, last September adopted resolutions offering the Bright Angel Trail for sale at public auction to be held October 25.

About this time a petition was circulated, originated by persons opposed to the sale of the trail to the Federal Government, asking that a referendum be held at the next

general election to determine the wishes of the voters of Coconino County regarding the proposed sale. The signatures of ten per cent of the county voters to this petition were necessary in order to call for the referendum. These were obtained, and the sale was postponed until after the referendum. This was held November 4, and by 400 votes the proposal to sell the trail was defeated.

Thus the Bright Angel Trail, despite the fact that it is in a National Park, owned and administered by Uncle Sam for all his people, remains a toll road, and Coconino County charges a toll of \$1.00 for each person journeying over it from the South Rim of the Grand Canyon down into the gorge.

Inseparably connected with the Bright Angel Trail controversy has been the legal battle for the possession of the numerous mining claims of Senator Ralph H. Cameron and his associates within the area of the Grand Canyon National Park. All of these claims at different times have been declared invalid, but the private interests involved carried the cases to the higher courts and maneuvered for time in every way possible. An especially bitter fight was waged over Indian Garden, along the right

of way of the Bright Angel Trail on the Tonto Plateau. Here is an abundance of pure water located in a splendid grove of cottonwood trees. This is an ideal place for trail parties to rest, and a lunch station was erected just below the private claims. All during the time the claims were in dispute, and after the decision of the Supreme Court that the original mining claims were invalid and must be vacated, a caretaker was kept at Indian Garden by the private interests. When it was discovered by the Public Health Service that the water supply at the lunch station was being contaminated, signs were posted warning the public that the water was unfit for drinking purposes, but these signs were torn down by the caretaker at Indian Garden. It was an intolerable situation. A special representative of the United States Attorney General was therefore sent to Arizona to handle the matter for the Government, and through his untiring efforts, in spite of a succession of almost endless obstacles, Ralph H. Cameron was compelled, in September, 1924, to withdraw his caretakers from the Indian Garden site and yield possession. Rangers of the National Park Service thereupon immediately took possession of Indian Garden for the United States. Thus ended the long-drawn-out struggle to determine whether or not one man, for personal reasons, could keep the whole American public, sole owners of the National Parks, from enjoying the benefits of this ideal resting place on the way down into the canyon.

Although the decree of the Supreme Court declaring the claims invalid ordered that all private buildings be removed, this was not complied with. The court therefore permitted the National Park Service to use and salvage such buildings as were valuable to the park. At the

time of taking possession of the Indian Garden claims the park rangers inventoried and sealed all Cameron property and held it for his disposal. Now plans are going forward for the construction of a novel rest-house at Indian Garden for the use of trail parties.

The status of the 54 placer mining claims of 160 acres each, located in 1918 and 1919 after the land had been withdrawn from entry by presidential proclamation of January 11, 1908, establishing the Grand Canyon National Monument, has not been definitely decided. Upon

investigation it was found that these claims were located not only upon the floor of the canyon but also upon a portion of the rim area, and cover Indian Garden and the sites of El Tovar Hotel and all Government, Santa Fe, and Harvey improvements. The Government has possession of all the claims, but the claimants were given authority by order of the district court dated January 3, 1925, to enter the claims for the purpose of taking specimens. It is essential, for the proper administration of the park, that all these claims revert unequivocally to the United States.

But what of the \$100,000 appropriated nearly a year ago for the purchase of the Bright Angel Trail? Fortunately, in making this sum available Congress provided: "For the construction of trails within the Grand Canyon National Park, \$100,000, to be immediately available and to remain available until

expended: *Provided*, That said sum may be used by the Secretary of the Interior for the purchase from the County of Coconino, Arizona, of the Bright Angel toll road and trail within said park * * *." Just as soon as the referendum last November decided the fate of the Bright Angel Trail, plans were made for the expenditure



Courtesy National Park Service.

THE MAXIMUM GRADE ON THE NEW TRAIL IS 18 PER CENT, AS COMPARED WITH 36 PER CENT ON THE BRIGHT ANGEL TRAIL, AND IT WILL BE POSSIBLE TO GO OVER THIS NEW KAIBAB TRAIL FROM THE SOUTH RIM OF THE CANYON TO THE NORTH RIM IN ONE DAY

of this \$100,000 on the construction of a new trail, as authorized in the appropriation act, and at this writing it is almost completed.

This new route, leading from the South Rim down to the Colorado River, and thence up to the spectacular North Rim and the adjacent Kaibab Forest, is known as the Kaibab Trail. The trail begins at Yaki Point, a low spur jutting out into the canyon, $3\frac{1}{2}$ miles west of Grand Canyon Village, and winds down this spur to the Tonto Plateau. From nearly every point on this part of the trail almost the entire length of that portion of the canyon included within the park boundaries is in view. It will undoubtedly be one of the most scenic trails to be found anywhere. This portion of the trail is entirely new construction. From the Tonto Plateau, however, the new trail follows the general line of the old Kaibab Trail to the North Rim.

The maximum grade on the new trail is 18 per cent, as compared with a maximum grade of 36 per cent on the Bright Angel Trail. In fact, for over 80 per cent of the distance its maximum grade is 15 per cent. The minimum width is $4\frac{1}{2}$ feet, and intervisible turnouts have been built so that parties may pass without the slightest inconvenience. Sharp zigzags have been eliminated and strong guard rails are being installed where necessary to insure safety.

In the Granite Gorge of Bright Angel Creek, across the river, the new trail has been located above high water and crosses the creek only four times, whereas the old trail in a distance of 3.6 miles crossed the creek no less than 68 times. The crossing of the Colorado River is made over the steel suspension bridge constructed a few years ago.

Probably the action of the voters at the referendum was a fortunate one for park visitors. The Bright Angel Trail is there, just as it has been for years, and is in use by trail parties; and in addition there will be this splendid Kaibab Trail over which it is possible to go from the South Rim to the North Rim in a day. Even the most inexperienced riders can make the trip in comfort in two days. This linking of the two rims by good trails makes possible much more efficient administration of the park as a whole. It also enables visitors making the trip from

railroad points in southern Utah to the North Rim to eliminate the long trip back into Utah by crossing over to the South Rim and taking the train there.

In this connection it is interesting to know that a new road project is under consideration. At present the South Rim and the North Rim, as far as motorists are concerned, might be several hundred miles apart, instead of the actual 10 or 12 miles. To take an automobile from the South Rim over to "The Strip," as that portion of Arizona north of the Colorado River is called, requires a long detour through New Mexico and Colorado. Therefore the great majority of visitors to the North Rim combine this trip with a visit to Zion National Park and other scenic areas in southwestern Utah and do not go to the South Rim, while those coming up from the south seldom get over to the "Strip" country with its wonderful Kaibab Forest.

All this will be changed, however, when the provisions of the bill passed by Congress during its last session, known as "An act authorizing the construction of a bridge across the Colorado River near Lee Ferry, Arizona," have been carried out. Lee Ferry is almost due north of the eastern boundary of the Grand Canyon National Park, near the Arizona-Utah state line. When the bridge and connecting roads have been built motorists going from park headquarters on the South Rim of the canyon to Zion National Park in Utah will traverse approximately only one-third the distance that now must be covered, while the trip from rim to rim by machine will be made in a day.

Congress authorized the appropriation of \$100,000 for the construction of the bridge and necessary approaches, with the proviso that the state must appropriate a like amount to cover half the cost, and in addition agree to maintain and repair the bridge and approaches. Neither the Federal nor state government has yet appropriated the necessary funds for this work, but the indications are that the money will be made available. Already the Governor of Arizona has recommended to the State Legislature that an appropriation of \$100,000 be made to cover the state's share of the expense of building the bridge and its approaches.

Forest People

Martha Berry—Her School and Her Forest

(Continued from page 401)

Roosevelt medal by President Coolidge at the White House on May 15th. Years ago, President Roosevelt became keenly interested in what she was doing and did what he could to help her, through enlisting financial aid for her work. With his great vision, he was able to look ahead through the years and see the enormous uplifting influence bound to develop out of this unselfish effort for the welfare of mountain women and children. In presenting the medal, President Coolidge said, in part:

"In building out of nothing a great educational institution for the children of the mountains you have contributed to your time one of its most creative achieve-

ments. Because of you thousands have been released from the bondage of ignorance and countless other thousands in the generations to come will walk, not in darkness, but in light. You have built your school by faith—faith in your vision, faith in God, who alone can make visions substantial. Few are privileged to receive so clear an answer to their petitions as you have received. Your achievement brings the mystery and beauty of divine guidance closer to us all. This medal will be a testimony to you that your fellow Americans are proud of you and wish you well in your labors."



EDITORIAL

The Game Refuge Bill

IS THE Game Refuge Bill, which has had every prospect of becoming a law early in the next session of Congress, to be scrambled on the griddle of dissension among the sportsmen themselves? We hope not, for the measure is the right bower in the great game of perpetuating our migratory wild fowl. Nevertheless, game conservationists of high standing are greatly concerned and deeply incensed over new opposition to the bill which has recently developed and which, it is feared, may so split the ranks of the game conservationists that no national wild fowl legislation will be possible for years to come.

A clear statement of the case, as seen by the Standing Committee on Wild Life, of the National Conference on Outdoor Recreation, is printed on page 416 of this magazine. The report of the committee, which was adopted at a meeting in Washington on May 28, at which George Bird Grinnell was acting chairman, demands careful reading, because it represents the views of men who have made game conservation their life study, and who stand as authorities in their respective fields.

While the committee's report is not specific as to the source of the new opposition to the Game Refuge Bill, it is common knowledge in the game fraternity that the real tempest broke with the publication of an editorial in the June issue of *Outdoor America*, the official organ of the Izaak Walton League. This editorial, which was reprinted in pamphlet form and mailed to members of Congress, called upon the members of the League and sportsmen everywhere to rally around a new bill to be sponsored by the League itself. The bill proposed as a substitute for the present Game Refuge Bill would depart in principle from that bill by levying a federal tax on all the people of the United States for the purchase of game refuges, and would place the administration of these refuges under the States in which they are located. Under the present bill revenues would be raised by a tax on those who actually enjoy the privilege of hunting wild fowl, and the administration of the refuges would be under the Biological Survey of the United States Department of Agri-

culture, as is now the case with the Migratory Bird Act.

Game authorities, who have been working for years for the passage of the present Game Refuge Bill and who have carried it to the very threshold of success, see in the new proposal not only an unsound measure, but grave danger of undoing all the work and progress that has been made by defeating the present bill on the very eve of its passage. Indeed, charges of breach of faith on the part of the president of the League have been made, based on the report that he agreed to support the present Game Refuge Bill when sponsors of the measure threw their strength to the Upper Mississippi Wild Life Bill and helped to pass it during the first session of the Sixty-eighth Congress. It is said that the legislative situation at the time was such that the two bills, both of which were pending in Congress, could not receive consideration, and the sportsmanship of the Game Refuge Bill workers in giving the League's bill the right of way was largely responsible for its passage.

Every conservationist who wants to see progress made in protecting our migratory wild fowl and in meeting the nation's moral obligation under the Bird Treaty Act will regret this impending split in the ranks of the sportsmen. It is difficult enough to get game legislation through Congress, even with the solid support of all the game interests, and when a measure has been thought out by the best wild life authorities in the country, as is the case with the Game Refuge Bill, it will indeed be unfortunate if the sportsmen do not pull together.

The present bill has been endorsed by no less than one hundred and twenty-eight national organizations, including the Izaak Walton League itself. It was passed by the last House by a huge majority, and it would have been passed by the Senate had not the congestion of legislation which marked the short session of Congress prevented it from coming to a vote. If the sportsmen will stand together and not break ranks to chase rainbows, there seems little doubt but that the Game Refuge Bill will become a law before the spring of 1926. Will they do it?

Forests by Education

THE project of The American Forestry Association announced on another page in this issue, looking to an intensive campaign of popular education in forest protection, will fill a long-felt want. When men and women gather to discuss any phase of the forest situation, whether it be taxation, forest fires, or some other knotty problem, the conclusion is invariably reached that the solution is to be arrived at only through the education of the public. While this important field of activity is much talked about and repeatedly stressed as the only sure road to forest reconstruction, it has been sadly neglected in comparison with educational work in other fields. In the case of agriculture, for example, the comparison is most striking. It is estimated that expenditures for education in agriculture in the United States by Government, state, and other agencies approximate sixty million dollars, while the annual expenditures for forest education approximate only about two million dollars, an insignificant portion of which is spent in the field of popular education, where the solution of the forest problem really rests.

It is, therefore, timely that the Association has undertaken to organize a definite, systematic, nation-wide movement of popular forest education. Representing all interests in the cause of forest preservation, the Association supplies the necessary meeting ground for all individuals and organizations to be definitely represented and to accomplish by co-operation what is now not being accomplished by individual and unorganized efforts. The time is most opportune and the need is admittedly great for all agencies to pool their facilities and unite in a continuous and well-directed campaign of popular forest education which goes to the very roots of forest protection in this country. The public mind is in a more re-

ceptive mood than ever before in the history of forestry, and progressive men and women in organizations of commercial, educational and social character are emphasizing the increasing need of educating the layman if real progress is to be made in meeting forest needs of the future. The educational force represented by a co-ordination of the many organizations now expressing a desire to take a hand in popular forestry education can not be overstated, and the opportunity offered by The American Forestry Association to pyramid their efforts and thus meet the need in the largest way will be immediately recognized.

It is the Association's plan to raise a budget of fifty thousand dollars a year for three years, to be expended through localized co-operative effort in teaching the public, especially the children, the WHY of forest protection and forest restoration. Ten thousand dollars of the annual budget has already been subscribed, and the remainder, it is hoped, will be speedily raised by private subscriptions from public-spirited individuals and from organizations which have a direct interest in perpetuating the forests. While the Association proposes to make the elimination of forest fire a special objective, the educational work will not be limited exclusively to that problem, it being held that the carelessness and ignorance of the public, which is responsible for 90 per cent of the forest fires, can be corrected only by instilling into the minds of men, women and children an intelligent appreciation of the value and the use of forests from every standpoint.

Forest conservation today is too much forest conversation, and not enough forward action. The Association's project provides a very definite and immediate means for everyone—individual and organization—to be represented in terms of CONSTRUCTIVE ACTION.

Water

COOL, refreshing, sparkling, cleansing, powerful—whether it comes from a bubbler on a hot street, a canvas bag on the dusty road, or a thin glass on the shady veranda of club or home—whether it hisses from a locomotive, flows quietly in a great commerce-laden river, or thunders through a mountain power plant—water is a common, accepted blessing which means little short of life itself. Millions of people have never felt the lack of it; thousands never think of its source or its importance.

But thoughtful Americans must consider the urgent necessity of restoring and maintaining green forests on the upper reaches of our great streams whose waters turn the wheels of industry in the eastern half of our country and in numerous instances furnish water for domestic use. The question as it applies to the country as a whole is ably presented elsewhere in this issue by Frederick H. Newell under the title, "Forests and Waters."

The West has long known and appreciated that prosperity and water supply are inseparable. But what of the East? Forty-six municipalities and ten large hotels secure their water from eastern National Forests or from lands located in purchase areas within which the Federal Government has been slowly acquiring land for the past fourteen years under the Weeks law. These communities appreciate the safety which is assured them through control of run-off in the catchment areas and through the forest changes which are tempering the hazards of floods and drouths and influencing the turbidity and sanitary quality of water.

Of no less importance is the effect of deforestation on the silting up of power reservoirs in which millions are invested. Erosion from the steep deforested lands of the watershed of the Little Tennessee River, upon which a two hundred foot dam has been constructed, is said to

have caused sedimentation reducing the storage capacity 10 per cent in five years. Another power reservoir on the Chattahoochee River is completely full of silt. With its storage feature gone, it is used by the power company only to secure fall. Other reservoirs in the same region, fed by streams from forested basins, show only a slow rate of sedimentation. These conditions are especially notable on the Ocoee and Tallulah Rivers.

Many streams, heading in the Appalachian system where the McNary-Woodruff bill will make possible the completion of the originally planned eastern National Forest system, are subject to devastating floods. Along the James River, in Virginia, runs a most important coal-carrying railroad which delivers coal to tidewater for northern shipment. Floods, aggravated by the absence of forest cover on the headwater slopes, often interfere with traffic on this road. The Black Warrior River, in Alabama, upon which large expenditures have been made to promote navigation for the purpose of shipping coal to tidewater, is subject to high floods which forested headwaters will help to control. On the great Ohio, with the Tennessee and its other tributaries furnishing a navigable inland waterway of more than 1,300 miles, the growing of more headwater forests will mean less dredging in its

navigable stretches. These are just a few of many examples.

Whose business is it to see that forests protect the headwaters of these interstate streams, the purity and even flow of which is coupled so closely with our prosperity? Individuals, corporations, States or Federal Government can not accomplish it working alone. The result sought must come from the combined effort of all these agencies. The task is so large that there should be no conflict of endeavor. But the very magnitude of the undertaking and its interstate character make it clearly necessary that the Federal Government assume vigorous leadership.

The undertaking is well started, so far as the Federal Government is concerned, but it is making slow and haphazard progress because of lack of a definite fiscal program. The McNary-Woodruff Bill, proposed by The American Forestry Association, supplies this necessary fiscal program. It must pass when introduced in the 69th Congress, and the appropriations which it authorizes must be made available if the water resources of the eastern United States are to be guarded properly and made permanently available for the highest interstate use.

Teaching Forest-Fire Prevention

THROUGH the activities of the Fire-Prevention Committee of the New Orleans Association of Commerce, a plan which holds great promise in stimulating the wider teaching of fire prevention in the schools of the country has been formulated. Beginning with the inspection of school properties by students in New Orleans during Fire Prevention Week, the idea was taken up through the State Association of local insurance agents with the State Board of Education, which has the administration of all public schools in Louisiana outside the city of New Orleans. Following the adoption of the idea of student inspections by both the city and state boards, the Louisiana Fire-Prevention Bureau, which is the insurance-rating bureau of the state, adopted a new schedule for rating public schools, colleges, day schools, seminaries, and universities which contained, among other fire-prevention items, a clause permitting a deduction of 10 per cent in the rate of fire insurance on all school property where there is included in the curriculum an approved course in fire prevention.

Here is a real stimulus to the teaching of fire prevention in schools and colleges. That the idea will spread to other states would appear to be a matter of course. While naturally questions relating to the safety of life and property in buildings will be given first consideration, it is encouraging to learn that the Fire-Prevention Committee of the New Orleans Association has been considering the desirability of including in the fire curriculum instructions in protecting forests from fire. The committee clearly recognizes not only that forest-fire prevention is a vital thing in conserving the wood supply, but that in many sections of the country there is a direct relationship between fire in the woods and fire in the school and home.

If, as seems probable, the state adopts as the fire curriculum for its schools the pamphlet entitled "Safeguarding the Home Against Fire," issued by the National Board of Fire Underwriters, forest-fire prevention will be included in the instruction because of the fact that this pamphlet contains an excellent chapter on forest fires.





THE CASE OF OUR MIGRATORY WILD FOWL

As Threatened by Latest Tactics of the Minority Opposition to the Game Refuge Bill

REPORT OF STANDING COMMITTEE ON WILD LIFE,
NATIONAL CONFERENCE ON OUTDOOR RECREATION

With Photographs by George Shiras, 3rd

THE Game Refuge Bill was not "defeated" in the last Congress. It passed the House by a majority of nearly two to one. More than two-thirds of the Senate had recorded themselves favorable to it. The Senate leaders considered the bill of sufficient importance to place it on the limited program for passage. Owing to congestion of legislation in a short session, the Senate merely failed to act on this bill, as it did on many others of great importance to the welfare of the country. The majority in favor of this bill in both Houses of Congress is still maintained and will grow, rather than diminish, because the people of the country need and demand this bill, which is vitally necessary to the continued preservation and increase of our wild fowl. If the present cooperation of all individuals and organizations shall be maintained, obstructive tactics of a small minority cannot, under such circumstances, prevent the final passage of this bill.

Owing to a misunderstanding of these facts, some sportsmen in certain sections of the country gained the notion that the bill was defeated in the last Congress and that, if we are to pass any bill at all, a new one should be introduced with radical changes satisfactory to the minority opposition. Since the changes proposed represent the views of the present minority opposition, the proposed new bill, if introduced, must be nothing but an opposition bill, and as such it cannot pass. But it can strengthen the opposition and make obstructive tactics so effective as to destroy for

the present this needed legislation in Congress. It is not conceivable that those who are advocating the views of the minority in Congress, and attempting to win sportsmen in the country to their views, realize what the inevitable result of their actions will be. Nor can they realize that the results of their efforts will finally fasten upon them the responsibility for deferring the realization of the legislative accomplishments which have been made. It is clear that they misunderstand the present legislative situation, and also the terms and significance of the present bill.



This article is written to clear up these misunderstandings and present the facts. The present Game Refuge Bill is too vital to the welfare of the country to have it obstructed by good intentions based on a lack of understanding of it. Before it shall be too late, everyone interested in preserving our waterfowl should read and consider the following statement:

Minority Objections in Congress

All Congress agrees that the purposes of the present Game Refuge Bill are necessary to perpetuate our wild fowl. But a minority assert that:

And the sponsors of the present bill are, with few exceptions, every sportsman's organization in the country, every state game commission, the Audubon Societies, the National Conference on Outdoor Recreation, every organization interested in saving wild life; in fact, the great majority of the people, as expressed by their representatives in Congress!

Brief History of the Present Bill

After the Migratory Bird Bill, which gave control of wild fowl and migratory birds to the Department of Agriculture, passed in 1913, Congress appropriated funds



Whistling Swans in Flight After Being Startled from Winter Feeding Grounds

1. Since the terms of the bill give control of the proposed refuges to the Department of Agriculture, this is an invasion of states' rights. The states themselves should control and administer them.

2. That the Federal license of one dollar for the privilege of shooting migratory birds, as prescribed, to raise money for the purposes of the bill, is an unjust method of taxation. The money should be raised by appropriation from the general funds of the Treasury.

These are the radical changes the proponents of a new bill would incorporate—the views of the minority opposition. This is the bill proposed to replace the present bill—one which seeks to impose the minority view on that of a great majority as expressed by the vote in the House, and the views of a great majority of the Senators expressed individually to the sponsors of the present bill.

pitifully inadequate to enforce it. Later, efforts were made in Congress to destroy the law by refusing any appropriation whatever. Sportsmen's organizations and friends of the law directed campaigns and activities to increase the appropriation. Slight increases were made, yet up to this date Congress has been unwilling to appropriate funds for more than *twenty-five* Federal wardens to cover the whole United States, including Alaska.

Continuous criticism from all parts of the country was directed at the Department of Agriculture for failure to enforce the law. The criticism, though misdirected, was justified. Congress did not give heed. The law can only be weakly enforced today.

Organizations and sportsmen, familiar with the history of game conservation, well understood that Congress never would appropriate sufficient funds for enforcement.

They knew that individual states had never done so in behalf of their own local laws. To obtain the necessary funds each state was compelled sooner or later to establish a license system wherein those who enjoyed the sport of shooting the game should pay to protect it.

Since each state was responsible for providing funds by license taxation for protecting the game under its jurisdiction, why should not the Federal Government likewise provide funds to protect the water fowl under its jurisdiction? Soon after the law was enacted, therefore, the question of a federal license was widely discussed, but without action, for the reason that nobody could suggest a practical method of collecting such a license without inconvenience to those who must pay it.

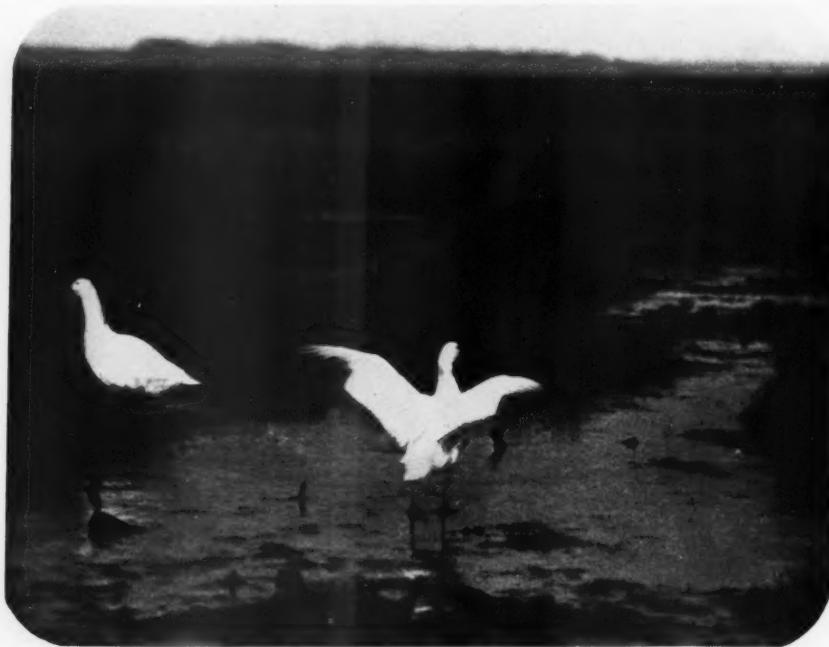
In the meanwhile, during these discussions, the results of the administration of the Migratory Bird Law were astonishing the country. Ducks yearly increased and were returning to their former breeding grounds throughout the states. Objections to the law rapidly vanished in the light of these facts. The whole country was gratified with the feeling that waterfowl had been saved and could by regulation be brought up to their maximum numbers.

But the Department of Agriculture was continuing a detailed study of all aspects of the waterfowl situation and soon discovered that under the yearly increase of ducks, drainage operations throughout the country and in Mexico had so increased as to destroy numerous marshlands which had provided feeding and breeding areas of the ducks. Along with the increase of waterfowl, the areas to support them were decreasing. The Migratory Bird Law had been passed to protect the ducks by restrictions of killing them. It was now realized that it was but a half measure. To complete it and insure the supply of waterfowl, a complementary measure was needed—one to protect certain marsh areas of the country.

Immediate steps toward that end were necessary. Dr. E. W. Nelson, Chief of the Biological Survey, called attention to the subject in a brief address before the National Conference of Conservation, held at Ottawa, Canada, February 18 and 19, 1919. He addressed a letter dated September 16, 1919, to Mr. J. Quincy Ward, President of the International Association of Game, Fish and Conservation Commissioners, Frankfort, Kentucky, calling attention to the vital necessity of permanently preserving these marsh areas from indiscriminate drainage, and urged definite action toward that end on the part of this Association at their annual meeting the following

October. The matter called forth interested discussion at the meeting and a committee was appointed to investigate it. Approval was given to the idea of Federal purchases of the areas, provided that in securing them the public would not unnecessarily be excluded from enjoying shooting privileges consistent with the preservation of the birds.

At once the whole ques-



Snow Geese Feeding in a Southern Marsh During the Winter.
It is Areas of this Kind that the Game Refuge Bill Will Save
for Our Migratory Wild Fowl

tion of the need of funds, not only to enforce the laws, but also to preserve the marsh areas, became one for necessary action. Congress, like the state legislatures, would never appropriate the necessary money, and the Federal license as a means of providing it came to the front. About Christmas, 1919, the idea of issuing them through the Post Office occurred to an individual interested in the subject. The practical question was solved. The Postmaster General was consulted and found to be favorable to the idea. The Solicitor of the Department of Agriculture gave an opinion that there were no legal objections to the plan. The bill was drafted in accordance with the ideas of organizations and individuals who from the beginning had been interested in the Migratory Bird Law, to meet the needs of the situation as developed by the investigations of the Department of Agriculture. It was submitted to many in Congress, sports-



A Picture which Shows what a Marshy Refuge Means to Our Wild Fowl. Here the Camera Caught the Ducks Rising in Alarm from Their Feeding Grounds, while the White Swan Appear to be Trying to Locate the Danger Before Taking Wing

men, game commissions, wild life organizations far and wide, and received enthusiastic endorsement.

Because the American Game Protective Association had with energy and ability organized and led the movement which put the Migratory Bird Law and Treaty through Congress, it was the logical selection for the purpose of sponsoring the Game Refuge Bill. It was therefore requested to undertake it. For four years this Association, with the increasing support of the whole country, has vigorously pushed this bill in Congress by enlisting wide activities of the people, after showing them the necessity for the passage of it.

The present bill, which will be reintroduced next session, is the amended bill passed by the House. The amendments were acceptable to the sponsors of the bill and to the Senate Committee. They do not affect the principles of the bill.

The State Rights Objections of the Minority Opposition

These are exactly the same objections which have always been urged against all Federal conservation measures in practice today, including Forestry and Migratory Bird Bill, and Migratory Bird Treaty Act, which is the same thing. If there is an individual in the country who does not know and realize the results of the Migratory Bird Treaty and who does not desire its continuance, his voice has not been heard. We all now agree that this treaty, so far as it goes, is the foundation on which rests the preservation of our wild fowl life. Why was it necessary? Because the wild fowl problem and that of migratory birds are not state but national and international ones. Their maintenance must be solved by administering them nationally in co-operation with adjacent countries in which they pass part of their lives. State administrations, which must be local, cannot solve the problems. For years they

tried it in good faith but failed. It was the recognition of this failure, threatening the destruction of our wild fowl and migratory birds, that passed the Migratory Bird Law and gave over the administration of the migratory birds to the Federal Government, where, of necessity, it must continue.

Yet read the objections voiced by the leaders in Congress who opposed the enactment of this law:

On July 1, 1912, in the House, Mr. Mondell of Wyoming objected to the consideration of the original Migratory Bird Law of March 4, 1913, in the following language:

MR. MONDELL: "Mr. Speaker, it may be possible that as objectionable legislation as this may get on the statute books. All things are possible in these days. In these days of hysteria all things may come to pass, but if this law should be put on the statute books of the country its effect would be to shame every man who advocated it. It is unconstitutional. It deprives the people of the opportunity to legislate on their own affairs in their own way. It substitutes Federal bureaucracy for local self-government. It is contrary to our theory of government. I shall have to object." (Congressional Record, Volume 48, Part 9, page 8549, 62nd Congress, 2nd session.)

In the consideration in the House of Senate Bill 1553 (Migratory Bird Treaty Act), to give effect to the convention between the United States and Great Britain for the protection of migratory birds, on June 6, 1918, Mr. Mondell said:

"What would the fathers have thought of such legislation, men recently liberated from the tyranny of a bureaucracy, of officers appointed by a distant power with authority to interfere with their local affairs? They attempted to prevent that for all future time and to leave with the local authorities the management of their local

affairs. Whenever we encroach upon those principles thus laid down and established we undermine the very foundations of our Government." (Congressional Record, Volume 56, Part 8, page 7450, 65th Congress, 2nd session.)

And here are the objections to the present Game Refuge Bill voiced by the leader of the opposition in the House. Mr. Garrett of Tennessee had the following to say:

"Of course, this bill has the support of the sportsmen of the country. They are back of it. I like to respect the wishes of the sportsmen of the country. The real sportsman is nearly always a big-hearted, generous, unselfish individual. (Applause.)

"But the trouble is that these gentlemen do not realize where this legislation leads to. Earnest as they are, and earnest as are the other societies that are supporting this legislation in their desire to preserve the wild life of the country, they fail to realize the precedent that is fixed here. They fail to appreciate the fact that this is but enhancing Federal power, taking another step toward adding to the restlessness and discontent of the average citizen with the Federal Government. Of course everything that is proposed in this bill could be worked out through the States. There is where it should be worked out." (Congressional Record, Volume 64, Part 4, page 3567, 67th Congress, 4th session.)

In the consideration of the Migratory Bird Refuge Bill in the 68th Congress, on February 19, 1925, Mr. Garrett of Tennessee had the following to say:

"Here is the trouble about this bill. This is another extension of Federal power, out to control the individual citizens of the States." (Congressional Record of February 19, 1925, page 4229, Volume 66, 68th Congress, 2nd session.)

Exactly the same opposition! Nobody with similar convictions can approve continuance of the Migratory Bird Treaty, nor can he approve the Bill passed last winter, to establish the Upper Mississippi Wild Life Refuge, which vests complete control over it in the Secretary of Agriculture, precisely the same as do the provisions of the Game Refuge Bill.

But the Game Refuge Bill does not change or increase Federal invasion of State rights. The significance of its provisions is misunderstood by the opposition. The pres-

ent Migratory Treaty has been upheld by the Supreme Court. It is a supreme law of the land. The terms of the Game Refuge Bill merely apply to its purposes the authority the Secretary of Agriculture already possesses over wild fowl.

Why, therefore, the objections on this ground of invasion of states' rights? It does not exist in the bill.

The bill does not coerce any state into parting with marsh lands or waters. Its terms expressly prohibit the Federal Government from acquiring any of the lands, either by gift or purchase, "*until the legislature of the state in which the area lies shall have consented to the acquisition thereof by the United States for the purposes of this act.*" Each state itself, therefore, is the arbiter

as to whether any of its areas shall be permitted to go into the possession of the Federal Government.

How, therefore, by the terms of this act are states' rights invaded? Do the objectors to this bill wish to deny to the states the right of voluntary action, which is constitutional, and which a state may believe to be in its own interest?

And yet, among legislators and thoughtful men there is anxiety because of a growing tendency toward Federal paternalism and increasing Federal bureaucratic control in Washington. There are good reasons for viewing such dangers with alarm. Resistance of them, however, should not be directed against all Federal activities. It should be discrimi-

native and not oppose entrusting to the Federal Government administrative control of migratory birds, which are continental and national and, therefore, cannot possibly be broadly and wisely administered by individual states.

The Problem of Administering and Preserving Wild Fowl

Why must the Federal Government administer these proposed refuges? Because the range of our wild fowl is continental. Those remaining on one area for a period of time soon depart and go to another area. The administration of the wild fowl in any one place must be varied according to the conditions elsewhere. Properly to preserve wild fowl they must be administered *not according to local but according to continental conditions.* For this purpose they must be regulated by the agency which can best administer them as a continental unit, the agency best qualified to study and keep in active touch with the complexities of continental conditions, and can



The Camera Caught These Black Ducks Just as They Were Leaving the Water, Bent on Hasty Flight

immediately act independently in each area as these conditions require.

Great numbers of wild fowl, having migrated south through the United States, winter in Mexico. What are the conditions in the various winter habitats there? Some of the largest marshes have been drained. Where have the wild fowl gone? Investigations must be made south of our borders. Protection of ducks there is necessary. International agreements for this purpose are necessary.

Great breeding grounds of geese and ducks are located near the lower Yukon and elsewhere in Alaska. An investigation of these breeding grounds in the spring of 1924 demonstrated that many thousands of the eggs and young each year are being destroyed by gulls. Birds banded in this region were taken this year in California. The preservation of the wild fowl in the Pacific Northwest is, therefore, closely linked with the elimination of the destructive agencies on the breeding grounds in Alaska. A large proportion of the ducks in the United States are likewise to be preserved by studying

and protecting the breeding grounds in Canada. Birds must be banded in each area to determine their migrating routes until finally the relation of the ducks in each marsh to other areas in the country will be understood. As drainage increases, concentration of ducks elsewhere must be studied in connection with the food supply. Prevention of the great mortality to ducks from oil-polluted waters off the coast must be undertaken. The shooting of ducks in an area of concentration caused by droughts in other areas, often those far distant, must be quickly regulated.

These are but few of the problems vital to preserving the wild fowl which must be solved and regulated. This cannot be accomplished by the states, each administering the ducks according to local conditions. The administration must be given over to one central organization with power to act nationally as may be necessary, continentally as may be possible. We have such an organization in the Department of Agriculture, and that is the reason why

control of the wild fowl has been surrendered to it.

The Game Refuge Bill only seeks to conserve habitats for migratory wild fowl, now being rapidly drained, and to provide funds for more efficient administration.

The Use of Federal Power Over the Wild Fowl

Will the Federal Government misuse the power which has been granted to it? The answer is to be found in the example before us in its use of power under the Migratory Bird Treaty Act. The answer is, NO!

The Department of Agriculture has complete power to regulate wild fowl in each state or section of a state, independently in all details. It has not so used it. On the contrary, it has established a few blanket regulations neces-

sary to reduce killing of wild fowl to numbers which leave breeding stock sufficient for annual increase. But it has permitted each state to make further regulations according to local opinion and conditions. The result has been a vast complex mass of state legislation without interference from the Department.



An Unusual Picture of Black Ducks as They Were Leaving the Water Preliminary to Flight. Note their Upright Positions as They Prepare to Get Under Flight

The Department co-operates with the states when possible, according to its ability. Between the Department and the states harmony for the most part prevails. This is the established practice of the Department. There is no reason to doubt a continuance of it.

Use of License Receipts

The terms of the bill do not apportion the use of the funds according to license receipts in regions or states, for exactly the same reasons mentioned to demonstrate why the Federal Government must administer the wild fowl. It is a continental problem, the welfare of the ducks of any one state being dependent on the welfare of those in other regions. The funds must, therefore, be applied without restrictions wherever it may be necessary. Each state will be best served by perpetuating the continental supply of wild fowl.

The Bear River marshes in Utah are temporary feeding and resting grounds for millions of wild fowl. In

seasons of low water, great numbers of ducks—in some years more than a million—die there from alkali poisoning. Investigations and the banding of ducks in this area demonstrate that these marshes are a reservoir of supply of ducks to all the surrounding states, from California to Texas, north to the Canadian boundary, and to Canada and Mexico. It is necessary to prevent this great annual loss of ducks. It can be done by diking and flooding the poisonous areas. This will require an expenditure of approximately \$200,000.00. It is estimated that the sale of Federal licenses in Utah would not yield more than \$10,000.00 a year. Should the expenditure of funds in Utah be limited to license receipts in that State, no remedy to prevent this great annual loss could be applied for twenty years. A decreased annual supply of ducks in other states would result. It is a national question and, therefore, funds should be applied there from the general fund as quickly as possible.

Similar conditions exist in other states, each area to be saved serving surrounding regions.

Funds must be applied to locate and preserve breeding grounds in Alaska and in Canada; to investigate and study wild fowl conditions throughout the continent; to disseminate information and conclusions pertinent to increasing knowledge of the conservation of migratory birds; and for many other necessities of good administration.

How could this fund from Federal license fees be expended wisely for the welfare of the wild fowl supply affecting all States, without freedom to use it for the whole country independently where most needed?

Is it not clear that any effort to localize the expenditure of funds would destroy the broad plans of administration which will best conserve the supply of ducks?

Why Federal License?

Why establish a fund by Federal license rather than by Federal appropriation? For two reasons:

First, Congress will never grant the necessary appropriations. No state ever granted them, even when the supply of its game was rapidly decreasing. Such an appropriation of large amounts is inconsistent with the Federal program of economy. Let no one deceive himself on this point.

Why will not Congress grant the necessary appropriation? For the same just reason that states never granted them, and this brings us to the second point.

The states did not believe that an indirect method of taxation by appropriation, which causes the tax to fall on the vast majority of its citizens, who derive no direct benefit from it, should thus be assessed for the enjoyment of the few who shoot game. Therefore, independently of each other, they devised the license system, wherein the tax would fall exclusively on those who received the benefit of it. The raising of funds to protect game by methods of license fees is the established system in every state in the country.

It has been carefully estimated that approximately one and a half million sportsmen annually shoot ducks. These

comprise less than one-fourth of the numbers who shoot other game.

Is it right and just to ask Congress to tax all the people for the benefit of this small proportion who enjoy the results of the tax? Those who enjoy the sport of wild-fowl shooting do not believe that it is.

The Principles of the Game Refuge Bill

The broad purposes of the bill are to provide funds by Federal license fees, to purchase and preserve marsh lands vital to a continuance of the wild fowl; and to establish better administrative control to perpetuate the birds. It adds no administrative powers not already possessed by the Department of Agriculture; no state needs to give up ownership and control of marsh or water areas without the consent of its legislature.

Sixty per cent of the funds derived from Federal license fees must be used for the rental or acquisition of refuges and the practical management of them; forty per cent must go for other administrative expenses necessary for the conservation, as complete as possible, of migratory birds, and for the very slight expense of the issuance of licenses under the act. The other details of the bill are for the purpose of making effective these broad principles.

The enactment of this bill as a complement to the Migratory Bird Treaty Act is vitally necessary for the preservation of our wild fowl. The dangers of rapidly increasing drainage are imminent. For four years the American Game Protective Association, the selected leader of the campaign necessary to obtain support for this bill, has successfully won over a majority of the people, and obtained the co-operation and support of all effective organizations in the country. A majority of Congress is favorable to passing the bill. It is only necessary to bring it to a vote. Continued and loyal co-operation to this end is necessary.

It does not seem possible that individuals who have supported it could, if they understood it and the reasons for it, as described in this statement, now have doubts and go over to the minority opposition and introduce another bill destroying the principles in the present Game Refuge Bill. They should clearly understand that if they do so their will be the responsibility for the inevitable result—the introduction of a rival bill, and the strengthening of the present opposition, which will defer this needed legislation for an indefinite time. They must in the future, if they are consistent, object to a renewal of the Migratory Bird Treaty when it shall expire in 1931; they could not consistently advocate Federal regulation of pollution in interstate waters; in fact, they could not consistently advocate any Federal activities in behalf of conservation in the states. Do they realize the significance of what they are doing?

In the end, however, the present Game Refuge Bill will win. It required sixteen years to pass through Congress the Migratory Bird Act, ratify the Treaty, and get it declared constitutional by the Supreme Court. During all this time a minority opposition fought it on exactly the same grounds used by the present opposition to defeat the Game Refuge Bill.

Recreation Principles for the National Forests

IN RESPONSE to a request by the Editor of this magazine for a statement of principles which the new Secretary of Agriculture, William M. Jardine, felt should govern the recreational use of our National Forests, Secretary Jardine replied on May 26 that he is very deeply interested in the recreational use of the forests but that he has not as yet found sufficient time to give the question the careful study which should precede his specific approval of principles. This, he said, he hoped to do upon his return from an extended western trip. The Secretary said that he had, however, discussed the subject in some detail with the Forester, who is familiar with his general views and had in preparation a statement in accord with those views.

"In my consideration of this subject," continued the Secretary's letter, "the points which stand out prominently are these: the National Forests purely as a by-product of their systematic management and without impairment of their primary functions are making an enormously important contribution to public welfare and social progress; that this result is being secured, not in conflict but in harmony with the intent of Congress; that, notwithstanding the large degree of free use which is

allowed, recreation in the National Forests is more than paying the costs of its supervision; and that the many people who know and use the National Forests are well satisfied with the present state of affairs. These facts lead inevitably to the conclusion that the Department's present policy is fundamentally sound and probably not in need of material modification."

The statement referred to by Secretary Jardine was later issued by the Forest Service. It reviews briefly the history of recreation on the National Forests, the manner in which it has been handled, and concludes with a statement of ten principles for handling recreation on the National Forests which the Forest Service would submit to the Secretary for specific approval. The growing problem which the Forest Service has yet to meet in the recreational aspect of the forests is indicated by figures given in the statement, showing that the number of summer visitors to our National Forests has increased from 3,160,300 in 1917 to 11,394,366 in 1924. There are printed below pertinent extracts from this statement issued by the Forester's Office and signed by Mr. E. A. Sherman, Associate Forester.

"Before the National Forests were thought of, the people of the surrounding country used these areas, so far as conditions permitted, for recreation; after the establishment of the Forests they simply continued this use and expanded it with the growth of population and the increased accessibility of the areas. The Forest Service did not create the idea of recreational use of the National Forests; rather, the public came in of its own accord, each year in increasing numbers, and the Forest Service, recognizing that recreation was a resource, like timber and water, used its best efforts to see that it was handled so as to make the greatest returns to the national welfare consistent with the chief purposes for which the Forests were established.

"To millions of people the National Forests are the natural, and sometimes the only available, playgrounds, other than their city parks. It is most vital to them that these areas should remain open for recreational purposes; but in this day of motors and good roads even the citizens of regions remote from the National Forests have a direct personal interest in recreation grounds where they can feel free to camp and enjoy themselves in their own way, so long as they obey the rules of good citizenship and good sportsmanship while in the woods.

"Is such a use a legitimate one, compatible with the purposes for which the Forests were created? Is the expenditure by the Forest Service of official time and public funds in the development of the recreational resources of the National Forests and in the supervision of their use by the public a legitimate expenditure?

"Forestry means trees; watershed protection means well-vegetated soils, gently flowing streams; these mean natural beauty, salubrious climatic conditions, more abundant fish and game, increased opportunity for wholesome outdoor play for both old and young. What disadvantage is there in allowing the people of the United States the fullest and freest opportunity to realize upon these by-products of National Forest management, if they

are careful with fire, refrain from polluting the streams, and do not interfere with the legitimate use of the material products of the Forest land?

"There are more than 150 National Forests; they contain a lot of land, 157 million acres; they are distributed from the Canadian border to the Mexican border, from Maine to California.

"By far the greater part of the National Forests were created from the public domain. They represent the residue of the great forest wealth once in public ownership; the most rugged and least accessible bodies of timberland which, through the greater difficulties of exploitation, had been least attractive to the private appropriator. They, therefore, consist, to a certain minor degree, of great peaks and ridges rearing above timber line; rugged canyons; tumbling streams and waterfalls; steep slopes; blank areas of little or no timber value; all interspersed among the valuable timber-bearing lands. Such areas cannot, as a rule, be eliminated from the National Forests without leaving the Forests a patchwork of complicated boundaries, uncoordinated units, and conflicting jurisdictions, difficult and expensive of administration. There is no reason why such lands should be eliminated, as their important public values can best be realized under public management and they can be publicly administered as parts of the National Forests much more effectively and at much less expense than in any other way.

"The factor which, in recent years, has done most to increase the use of the National Forests for outdoor recreation is the extension of the public highway system under the Acts of Congress approved March 4, 1913, July 11, 1916, February 28, 1919, and November 1, 1921. Through the instrumentality of these Acts the National Forest areas, which previously had stood as partial barriers to free trans-state movement, have been made much more accessible to the motorist. The roads were not built to promote recreational use, but on the contrary were designed to

fill in the gaps in the state and county systems of public highways. Their purpose was and is to promote the free movement of people and commodities, to facilitate the use of the raw materials produced by National Forest lands, and to permit the better protection of the public properties. The fact that these roads give access to areas of recreational value is an incidental result rather than a primary purpose in the projection and construction of the road system.

"As recreational use increased in volume the Forest Service initiated certain constructive activities, not so much to promote recreation as to protect public property and public health. In order to concentrate the people upon areas of least hazard from the standpoint of fire and sanitation, camp grounds were set aside and partially developed. Summer home communities were encouraged and progress was made in plans to care for the increasing numbers of people who resorted to the Forests for recreation.

"No charge is made for permission to use the National Forest highways, trails, camp grounds, or lands, except where exclusive rights or special privileges are desired, and these are allowed only where they do not interfere with free use of the Forest by the general public. People use the Forests without restriction or restraint, except where it is necessary to require that camp-fire permits be secured, free of charge, or, in rare instances of great emergency, to restrict people to designated camp grounds or to exclude them from areas of exceptional fire danger. Ordinarily each visitor has unrestricted opportunity to follow his own bent.

"The fact that the majority of recreational uses are allowed without charge does not mean, however, that this form of service is not self-sustaining. It more than pays its way. . . . Notwithstanding the large degree of free use allowed, the revenues from recreational use exceed the expenditures for such uses.

"Unless some radical change is made in National Forest policies which will discourage or restrict recreational use, it is probable that the use of Forest highways, trails, and camp grounds by the recreation-seeking public will progressively increase. . . . The present question is whether this growth should or should not be allowed. It can be taken care of without any serious impairment of or interference with the primary functions of the National Forests, and the question is purely one of Departmental policy or organization.

"In considering the question, the people of the United States will want to know how the Department of Agriculture will be

guided in its future treatment of the subject. In categorical detail, the principles the Forest Service will submit to the Secretary for approval are as follows:

"1. The recognition of recreational use as a form of National Forest-land service of great public value and importance, which shall be systematically co-ordinated with other forms of land use, such as timber production, streamflow protection, and forage production.

"2. The recognition of recreation management within the National Forests as a function of the Forest Service, which, in discharging that function, may apply to areas of recreational value the methods required for their best development, to the extent compatible with other National Forest requirements and within the limits set by Congress.

"3. The retention under National Forest management of all areas of recreational value, except where Congress considers that that value so completely transcends all others and is of such public importance as to require a separate and specialized management.

"4. The systematic extension of recreation plans to all areas of National Forest land possessing recreational value.

"5. The continuation of present plans for the establishment upon National Forest lands of county, municipal, semi-public, and private outdoor camps, sanatoria, schools, resorts, hotels, etc.

"6. The encouragement of simple, inexpensive forms of mass recreation, including the extension and improvement of public camp grounds upon National Forest land.

"7. The continuation of the present policy of making no charge for recreational use of the National Forests, except where the land is used for commercial purposes or exclusive use of specific tracts or other special privileges are granted.

"8. The continuation of the policy authorized by Congress of issuing permits for individual summer homes or cabins where they will not interfere with more general forms of public recreation.

"9. The encouragement, through equitable permit provisions, reasonable rental charges, and minimum restrictions, of the establishment upon Forest lands of the various utilities or forms of service needed for the convenience of the public.

"10. The regulation of recreational use of National Forest lands to—but only to—the extent necessary to protect public health and property, to secure reasonably full development and utilization of recreational resources, and to avoid undue conflict with other uses of the Forests."

Forests and Waters

(Continued from page 409)

may be put off with safety for an indefinite time if the watershed from which the supply is obtained is preserved as a forest and industries are restrained from going upon the headwaters.*

Next after domestic supply, food production and maintenance of health conditions, comes the use of water in the industries and particularly for electric power production. The use of electricity in the home and on the farm as well as in the factory is spreading by leaps and bounds. It is entering more and more into the daily life of all of

us. Anything, therefore, which tends to equalize stream flow or prolong the useful life of a reservoir may thus reduce the cost or increase the convenience of electric power and add to our comfort and prosperity.

From every standpoint the protection of the water supply is vital to the nation. There can be no life nor health for man, animals, or vegetable growth without an ample supply of water of the right kind and quality, and at the right time. This use rises supreme to all other needs, since it involves life itself.

* See, in this connection, statement by Gerard H. Matthes in the hearings before the Senate Committee with reference to Muscle Shoals site. (Senate Document 319, 67th Congress, p. 110.)

See also "Report of Progress of Purchases of Eastern National Forests," issued by National Forest Reservation Commission December 1, 1922, regarding the protective effect of forest growth on the various eastern national forests, with especial reference to the Little Tennessee River.

Barometers of the Desert

By EDWARD P. ANCONA

IN THE SPRING of 1923 Antonio Lopez, a Papago Indian living near Tucson, in Arizona, set himself up as a weather prophet. Not by the shadow of the ground hog so generally made use of by amateur prophets country-wide nor by the shape of the breastbone of a goose, a favorite basis of weather prophecy in some Eastern States, nor by the flight of a bird did this son of the desert foretell the season to come. As for following in any degree the intricate processes of the Weather Bureau, well, this red man is not even aware that his white brothers have such an organization.

wild store robbed from some almost inaccessible pocket in a rocky cliff is truly the nectar of the desert.

But to go back to Antonio. Out of the wealth of his years of observation, Antonio said he saw in the mesquite the promise of abundant rains in the summer months—normally the rainy season except in those cycles when for two or three years the desert thirsts and the rainy seasons pass by, rainy in name alone. The abundant blooms and fat crop of beans, in spite of an eight months' drought, were the unfailing signs, according to this child of nature. From somewhere down in those great depths to which the



IN THE LAND OF THE WEATHER PROPHET OF THE DESERT

Very naturally Antonio turned to what he knows best—the signs in the desert plants of his own neighborhood. Of all these plants, this knowing Indian selected the mesquite.

This desert tree, closely related to our more familiar locusts, acacias, and many other tree species, plays an important economic part in the life of the Southwest, particularly those lower, drier plains and foothills in the desert. Often the only available fuel wood and widely used for posts, for which it is extremely durable if some of its bug enemies are kept out, the mesquite also serves man's four-footed friends by bearing a highly palatable food—the mesquite bean. In April, May, and June the countless square miles of desert are heavily laden with the exquisite fragrance of its blossoms and the rich harvest of the bees is on. And who, once having tasted the famous desert honey, largely brewed from the mesquite, will return to his early love, made from clover, buckwheat, alfalfa, or what not? Either the cultivated variety or the

mighty taproot of the mesquite goes in search of moisture—a tree, by the way, with most of its wood structure beneath the surface of the soil—there was drawn a reserve vitality to grow a heavy crop of seeds in anticipation of the coming rains, which were to germinate these seeds.

Antonio Lopez was right, either by chance or otherwise—take your choice.

Here's the tale of the Weather Bureau record for Arizona for that same summer: "July—Rain fell in some portion of the state practically every day after the 4th. Generous rainfall. Ranges were greatly improved by the rains and were in excellent condition. August—Precipitation for the state as a whole was above the average. Exceeded only four times in the past twenty-six years."

But Antonio, in spite of winning this time, has his scoffers. His prophecy getting into print, others came forth with stories to the opposite effect. For instance, it is said old timers—white men, not red—in west Texas and New Mexico always predict a dry season when the

mesquite come forth with a heavy bean crop. However, the crop was reported *poor* in southern New Mexico that spring—the same spring that Arizona beans were plentiful. And New Mexico had good rains, too, that summer! So that's that! But who shall say that both or either were wrong—or right? Perhaps the New Mexico and Texas mesquites are just the opposite sort of barometers to those in Arizona.

One of the forest rangers down on the Gila National Forest came forth with more evidence that a generous mesquite bean crop meant a season of scanty rain to follow—at least in New Mexico, remember. I am inclined to take Ranger Ben Nabour's size-up of the mesquite as a weather barometer as nearer correct than any of the old timers quoted.

To begin with, when one of these rangers says anything based on his observation, take my word and hear him out. He's usually got something to say. Observations, the taking account of signs, nature-made and man-made, the analysis of these signs and what they mean, are his daily fare. Further, these chaps are getting to be inveterate notebook carriers. They see so much, have so much to note, that memory is not relied upon to carry the facts. They put them down for later study at the station desk or

around the camp fire. Times have changed from the early days when a ranger was selected, perhaps partially, at least, on the basis of his ability as a quick gun-draw artist. Today it's the quick-draw notebook fellow that fills the higher-paid jobs.

Well, Ranger Nabour will close the case opened by Antonio Lopez, and, since we, as the scribbler judge, think him right, no rebuttal will be allowed Antonio. Here's what Ranger Ben says: "There was a heavy crop of blooms and mesquite beans through the Tularosa Basin a year or so ago—which was all that kept the stock alive during that year; yet I am sure the rainfall was below normal, and in a few places no rain fell during the growing season. From my own observations, and I believe all who are familiar with mesquite range will concur, a good crop of blooms and beans usually occurs when there is no rain on the mesquite while in bloom. This season is usually from the latter part of April up till about the tenth of June, and the absence or presence of many blooms may or may not indicate a good season to follow."

Which wise deduction means that, after all, the mesquite very likely is not a barometer at all, but in its bean crop only records what happened in the way of weather, particularly rainfall, during the time it was in bloom.



THE FOREST

By Florence Polk Holding

I KNOW a land of heart's desire
Not very far away.
By traveling fast I could aspire
To reach it in a day.

A virgin stand of forest trees,
This place of my delight,
Where giant sentinels of God
Stand guard both day and night.

Where one can walk for miles on paths
Laid down by countless leaves.
Majestic as cathedral aisles,
The arches of the trees.

Where little brooks delight to thrill
And tumble at their play,
Where deer may wander without fear
And birds sing all the day.

Dear forest, when I think of thee,
Of thy broad oaks and scented pine,
And singing brooks, O how I long
To lose my life in thine!



A Forester's Search for Forests in China

(Continued from page 390)

The road from Tungkwan to Sianfu left the Yellow River and skirted the north edge of the Hwa Shan (Flower Mountains), which rise abruptly from the alluvial plain fully 5,000 and more feet. The summits were covered with snow and from the range numerous clear small streams flowed across our road on into the Wei River, not far distant to the north. At the foot of the Hwa Shan, where the soil was subirrigated, are excellent examples of woodlot forestry. The growing of trees (*Populus simoni* Car.) is combined with the culture of wheat and vegetables. First quality agricultural soil is used and irrigated for the production of wood. The importance of wood and timber in national economy seems here to be demonstrated. The growing of trees for wood and timber on irrigated farm land is also practiced in the alluvial plain near Sianfu. The natural query is: why is not timber grown in the near-by mountains, where the soils derived from igneous rock and the more plenteous precipitation of the high land favor tree growth? The lack of protection from theft perhaps accounts for the absence of forests on the hills. So great is the demand for fuel and wood that the mountain sides are annually shaved clean of all herbaceous, shrub, and tree growth. The coppicing species only persist except in the temple and grave enclosures, where the dead are more effective in protecting trees than the living. The mountain lands accordingly are commons or public land which are open to fuel gatherers, who permit no seedling or sprout to become a tree.

The streams, with catchment basins extending back for some distance in the mountain range, had great dumps of rock, pebbles and silt where they discharged upon the alluvial plain. These were evidences of the torrential character of streams resulting from the skinned and denuded and despoiled slopes within the range.

When fifty miles from Sianfu the road left the mountain, swinging southward. Near Sianfu it crossed on a

famous bridge the wide, sand-filled bed of an important tributary (Ba Shui) of the Wei River. At the time of our crossing a meagre flow of water made its shallow way over the sand. The great width of 1,500 feet is ample evidence of a large flood discharge. The stream bed is filled with sand which has nearly buried the bridge pillars and leaves scanty room below the girders.

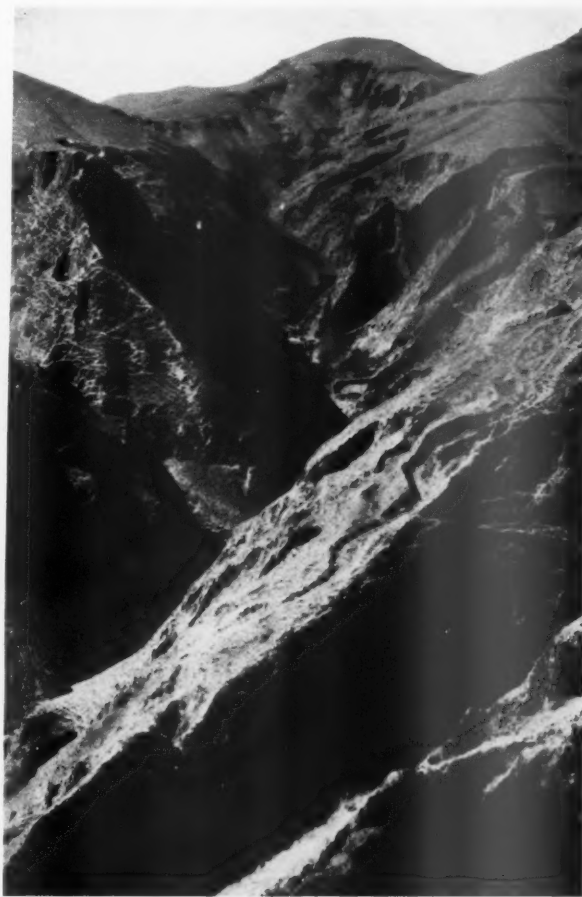
The city of Sianfu is in the form of a square, each side

of which is two miles long. Two wide avenues intersect at the center, where a tower stands commanding each avenue to the city wall. Fully one-fourth of a million people live within these protecting walls. This is the site of the capital city of China during the Golden Age. Wealth, prosperity, and plenty, with the accompaniments of artistic, literary and religious activity, marked this period two thousand years ago. The mountains were undoubtedly covered with forests, for only 700 years ago Marco Polo describes forests 3 days from Sianfu, that do not exist today. The prosperity was in part due to a great irrigation system which now is silted up and out of use. The products of the mountains and the fertility of the mountain soils must have contributed much to the prosperity of the Golden Age.

What a miserable state the region now presents! It is ravaged by intermittent famines, parched by

long droughts, overrun by robber bands and bled by military parasites. Villages are in ruins, the monuments of former grandeur are neglected and in some cases are half buried under silt. In the absence of irrigation, scarcely the minimum of needful cereals are grown. Costly and slow transportation preclude manufacture. Coal, which is plentiful 50 miles north of Sianfu, is now packed out on muleback.

From Sianfu two important side trips were made: one over the ancient irrigation project which Mr. Todd was hoping to rehabilitate and the other into the Wu Tai Shan of Shensi, about 25 miles south of the city. This templed



W. C. Loudermilk.

EXCESSIVE EROSION IS DEVOURING THE LAND IN THIS VIEW. IN THE BOTTOM OF THE GREAT GULLY MAY BE SEEN A FEW WILLOW TREES. THE REMEDY FOR THIS EROSION WOULD SEEM TO LIE IN FILLING THE GULLY AND LOWER SLOPES WITH WILLOWS AND POPLARS

(Continued on page 444)

Tree Planting Honors the Mothers of the Nation

WITH beautiful pageantry and an impressive program, a white birch—nationally known as the “Mother’s Tree”—was planted on the grounds of the Capitol of the United States, directly east of the Capitol building, on May 9th, and dedicated in honor of the mothers of the nation.

Forty-eight little girls, costumed to represent the flowers of the various states, each escorted by a boy bearing the pennant of the state, marching across the Capitol lawn to the music of the Navy Band, were met by the figure of Uncle Sam, ostensibly taking a stroll about the grounds of his Capitol, with a friend of his, in old Colonial costume. Accosting the youngster at the head of the procession, he inquired what it was all about, and was told that they had come there to plant a white birch tree to honor the mothers of the nation. Saying that the project had his hearty approval, Uncle Sam then turned to his companion—who proved to be none other than George Washington, the Father of his Country—who spoke to one of the children, asking her, “And who are you?” Replying, she said: “I represent the District of Columbia, the seat of our Government, and I am gowned as an American Beauty Rose—the flower of the District of Columbia. I come to help plant the Mother’s Tree, and to lay my tribute of bloom at its feet, and these are my companions.”

The planting then proceeded, following a poem dedicated to the white birch as “Mother’s Tree,” beautifully given by Miss Ruth Chindblom, daughter of Representative Carl C. Chindblom, of Illinois.

Mrs. John Dickinson Sherman, president of the General Federation of Women’s Clubs, met the group of children at the tree and placed the first earth on the roots. Secretary of Labor Davis was the first speaker, and he was followed by Mrs. Sherman, William Tyler Page, Clerk of the House; Shirley W. Allen, Forester of the American Forestry Association; and Mr. Solan L. Parkes, of Reading, Pennsylvania, with brief addresses of tribute to motherhood.

The tree, a specimen white birch from the Amawalk Nurseries, was the gift of the American Forestry Association. The planting was under the auspices of the District Federation of Women’s Clubs and was brought about largely through the efforts of Mrs. Eva C. E. Chase,



© Harris & Ewing.

THE PLANTING OF THE “MOTHER’S TREE”

Mrs. John Dickinson Sherman, President of the General Federation of Women’s Clubs, and a Director of the American Forestry Association, puts the first spadeful of earth on the roots of the tree, while Uncle Sam and Miss District of Columbia—the American Beauty girl—look on. Mrs. Eva Chase, Conservation Chairman for the District Federation, stands beside the flag.

chairman of Conservation of the District Federation, assisted by Mrs. Edgar Snyder, vice-chairman, and her committee.

LET ME BE A PINE

LORD, let me be a pine that lifts its hands up
high
To grasp the subtle secrets of the sky.
The maples blush on lower spheres;
The hemlocks bow their backs;
The willows lean their heads to list
To whisperings of running brooks;
But, oh, the pines do never tarry in their climb
Up to the stars.
Lord, let me be a pine.

—Edna Smith De Ran.



Reproduction from a painting made on the estate of Mr. Potter Palmer, Sarasota, Florida, by Frank Swift Chase © The D. T. E. Co., Inc., 1925

Cement fillings in trees are like dentistry

In the treatment of a cavity in a tooth, the dentist must do at least three things. First, he must clean out all the decay and prevent further decay. Second, he must prepare the cavity so that the filling will stay permanently in place. Third, he must exclude all foreign substance, especially moisture.

The Tree Surgeon must do all of these things and more. He must contend with the swaying and twisting of the trees in the terrific winds. Therefore, Davey Tree Surgeons build their cement fillings in sections, like the backbone in the human body, to allow for this sway and to prevent cracking and breaking. This sectional filling method is a patented process, used exclusively by Davey Tree Surgeons, and is the one thing that

made successful Tree Surgery possible.

Why use cement fillings in trees? There is no filling material for tree cavities that the Davey Company could not use. Every alleged substitute for cement has been offered to the Davey Company by its enthusiastic promoters and has been thoroughly tried by the Davey Research Department. Nothing begins to equal cement as a successful filler for tree cavities.

Cement, when properly used, has great lasting qualities. It has tremendous crushing strength. When properly braced, it provides the necessary mechanical strength for decay-weakened trees. When used in sections, it does not break in the wind sway, and it remains a permanent integral part of the tree.

It protects the inside wood from further infection and decay. It provides a solid surface over which the new bark can heal. It is reasonably cheap, everywhere available, and easily worked.

The idea of cleaning out tree cavities and leaving them unprotected is scientifically wrong. Would any reputable dentist leave a tooth cavity unfilled? The inside wood in an open cavity invariably cracks and induces decay much deeper than before. This was the crude practice of fifty years ago, before John Davey gave to the world the science of real Tree Surgery. Davey Tree Surgery is practiced by thoroughly trained, professional men, and is a proved success.



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J. E. TIMMONS, Curator, Detroit, says: "We have not seen a live rat since using it, also it has done no damage to any animals, birds or squirrels."

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The Capital Chooses an Official Flower

By EVA C. E. CHASE

THE American Beauty Rose has been selected as the flower of the District of Columbia, and this choice seems to meet with universal favor. It has been found difficult to decide upon any one flower which combined the necessary features to meet the requirements for an official flower for the capital city of the Nation. Aside from the exquisite beauty of the flower, both the leaf and the bud lend themselves well for use in pictorial or sculptural art, and Mr. Harris, who is Municipal Architect of the District, says that he will use it, wherever appropriate, in the public buildings of the District.

In ending the long quest for an official flower for the District, the Commissioners issued the following statement: "Ordered, That the American Beauty Rose is hereby adopted as the official flower of the District of Columbia. By order of the Board of Commissioners, D. C. Signed by Daniel E. Garges, Secretary to the Board."

Originating in France, this rose was brought to the full development of its beauty in this city, being planted by Bancroft, the historian, in his garden in Washington in 1886. The dignity and beauty of this aristocrat of the rose family is too well known to need enlargement, but it is perhaps not as well known that the rose is easy of cultivation. There are forms—particularly the climbing American Beauty—which can be easily grown in any garden and which are a source of ever-increasing delight to their owners, blooming profusely and having an exquisite fragrance.

A "Perfect Day"

'T WAS even'n', at the twilight,
'Bout an hour after sun;
You'd dried your fishin' tackle
And wiped the trusty gun.
Old Sport was snoozin' softly,
Stretched out there near the stream,
While twitchin' feet and lowly bark
Told of huntin' in his dream.
Smoke from many smudges
Was curlin' here and there,
Makin' it mighty difficult
To get a breath of air.
Supper, too, is over, and
There was not a thing to wash;
The fryin' pan is all you'd used
And "'twas clean enough, b' gosh."
Your boots are full of gravel
And your feet have lost much skin;
Your neck and arms are badly burned,
But you'd do it all agin.
Tho' luck has been against you,
And you failed to fill the creel,
You've been away and had your day,
And—gee, how good you feel!

—Dr. J. L. Safford.

NORWEGIAN FORESTRY ASSOCIATION'S PLANTATIONS IN FRANCE

As an aid to the rehabilitation of devastated French forests, the Norwegian Forestry Association has made a gift of plantations to the French Government. The first trees were planted in 1920 by Norwegian foresters near Valenciennes on the Belgian frontier, using Norwegian stock. Subsequent plantings and sowings have taken place every year on a state forest. Norway spruce and Scotch pine were the species used.

TIMBER-CUTTING RESTRICTIONS OF 175 YEARS AGO

In each grant for a township in the provinces of New Hampshire—the present State of Vermont—Benning Wentworth, Governor in 1749, made the following restrictions, according to the Vermont Forest Service:

"That all white or other pine trees within the said township fit for masting our royal navy be carefully preserved for that use, and none to be cut or felled without our special license for so doing, first had and obtained, upon the penalty of the forfeiture of the right of such grantee, his heirs and assigns, to us, our heirs and successors, as well as being subject to the penalty of any act or acts of Parliament that now are or hereafter shall be enacted."

Today the State of New Hampshire requires that one thrifty white pine tree be left to each acre for seeding purposes.

FORESTRY TALK OF 200 YEARS AGO

Prof. A. Lawrence Kocher, of Pennsylvania State College, has recently unearthed from the travel records of Peter Kalm, the great Swedish naturalist, covering his travels in North America from 1748 to 1751, the following interesting notes:

"We can hardly be more lavish of our woods in Sweden and Finland than they are here; their eyes are fixed upon the immediate gain and they are blind to futurity.

"To encourage the planting of this useful tree (white cedar) a description of the method of doing it, written by Mr. John Bartram, was inserted in a Pennsylvania almanac, called Poor Richard Improved, for the year 1749. In it was explained the manner of planting and augmenting the number of these trees."

Mrs. MARY DOLMAN INSKEEP, of Berkeley, California, writes on May 18th: "You will be glad to know that the magazine, AMERICAN FORESTS AND FOREST LIFE, was made the basis of the American Forest Week work in all our Berkeley elementary schools."



BROAD-LEAFED EVERGREENS—

One Vital Care Point

IN THEIR natural environment, *Rhododendrons* are found growing in the rich, moist soil produced by centuries of falling leaves—a soil that is more than half humus. The roots of *Rhododendrons* being shallow, they will only thrive in just such a rich moisture-holding top soil. These roots don't incline to "go down into the ground for water."

If you would have your *Rhododendrons* hold their beautiful dark green, waxy foliage and give you freely of their wondrous blooms, you must furnish them with a soil made rich with humus. You must also mulch them heavily with rotted leaves, manure, or humus.

Alphano Humus, when mixed with soil, produces an ideal root home for *Rhododendrons*. It furnishes a perfect, balanced ration and holds just the amount of moisture to make the roots happy. As a mulch it surpasses manure or leaves, because it lasts longer, is not unsightly, has no odor and, being in powdered form, can be evenly distributed over the soil.

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TENNESSEE EXPANDS FORESTRY PROGRAM

The Tennessee Division of Forestry will have at its disposal \$23,100 for the next two years, which is a considerable increase and which will make possible the building up of a larger fire-prevention and suppression force and expanding publicity and educational work in forestry. State Forester R. S. Maddox is also working on a plan of co-operation with the state of North Carolina and with the Federal Forest Service.

GEORGIA FORESTRY ASSOCIATION

Plans for introduction of a new bill for a State Forestry Department were discussed at the meeting of the Georgia Forestry Association at Waycross, Georgia, on May 18. There was a general feeling that the campaigns of the past two years will culminate in the prompt enactment of a forestry law in the present legislature.

LUMBER CUT FOR 1924 WAS 37 BILLION FEET

According to a Census Bureau announcement issued May 4, 769 large sawmills in the country have reported a cut of 16,210,107,000 feet of lumber in 1924. The same mills reported 16,910,025,000 feet in 1923, the 1924 decrease being 700,000,000 feet, or 4 per cent. In 1923 the cut of these mills was 45.5 per cent of the whole reported lumber output. If their proportion remained the same in 1924, the total 1924 reported production would be 35,620,000,000 feet and the total of production 37,000,000,000 to 37,500,000,000 feet.

RECREATIONAL SURVEY OF FEDERAL LANDS MAKES PROGRESS

Neglected possibilities for recreational use of Federal lands are being uncovered through

the work of the Joint Committee on Recreational Survey of Federal Lands, made up of representatives of The American Forestry Association and the National Parks Association and appointed by the National Conference on Outdoor Recreation.

Philip R. Hough, chief clerk of the committee, will visit the western field divisions of the General Land Office during the present summer to locate and secure information on areas of the remaining public domain adapted to outdoor recreation.

The object of the committee is to secure a complete inventory of such places, as well as those now under administration by the various departments.

AIRPLANE FOREST PATROL TO START JULY 1

Airplane fire patrol of the forested regions of California, Oregon, Washington, Idaho, and Montana will start on July 1 and continue throughout the summer and fall fire season. Five bases, from which 18 planes will operate, will be established, as follows: One each in northern and southern California, one in Oregon, one in Washington, and one either in eastern Washington, northern Idaho, or western Montana. Clover Field, at Santa Monica, will be the southern California base; other bases have not yet been definitely decided upon.

At the request of the War Department and in active co-operation with the Air Service of the United States, the Forest Service will supervise all forest air patrol activities. Paul G. Reffington, California District Forester, United States Forest Service, San Francisco, will be in charge of the Pacific Coast patrol, and the Air Service will appoint a liaison officer to co-operate in the working out of the details of flights, bases, and personnel. Regular airplane patrol over forested areas will not be maintained this season, but planes will be available at all times for special flights dur-

ing periods of great fire danger and for reconnaissance work on large fires.

VERMONT BLISTER-RUST WORK

To date, approximately 25.7 per cent of all white pine in Vermont has been protected from blister rust by currant and gooseberry bush eradication, and ratio of area protected to area eradicated for Vermont is approximately 1 to 4.2.

About 10,000 acres of pine must be protected each year for the next five years, in order to complete the control program by 1930.

NEW HAMPSHIRE USES A LOT OF WOOD ANNUALLY

New Hampshire uses 750,000,000 feet of lumber annually, according to State Forester J. H. Foster. Of this, 450,000,000 feet are cut in the state and 300,000,000 feet are brought in, at great expense, from the other states.

This 450,000,000 feet cut in the state is a drain and will cause a depletion, because the annual growth on timber in New Hampshire is only 350,000,000 feet. Formerly, wood was not cut until at least 60 years old; now trees 30 years old are being cut for box boards.

CALIFORNIA WOODPECKER FINDS NEW STOREHOUSE

Park Ranger Clarence W. Fry, of Sequoia National Park, was much mystified recently to find that one of the Government trucks had developed internal difficulties of a most peculiar and hitherto-unknown nature. The mystery was solved when, upon putting the truck on the rack for overhauling, Mr. Fry found the radiator, the cap of which had been missing, full of acorns, deposited there for safe keeping by a California woodpecker. All radiators are now kept tightly capped.

NATIONAL COMMITTEE ON WOOD UTILIZATION ORGANIZED

A practical working organization has been completed to carry forward the movement for wood-waste reduction recommended by the National Conference on Utilization of Forest Products, held last November in Washington, D. C. With the approval of President Coolidge, a National Committee on Wood Utilization, representing a wide range of wood manufacturers, distributors, and consumers, held its first meeting in Washington on May 2, 1925, at the call of Secretary Hoover, and took the initial steps to foster a national movement to save timber and eliminate waste by better methods of manufacture and use.

The personnel of the National Committee on Wood Utilization is as follows:

Herbert Hoover, Secretary of Commerce, chairman.

William B. Greeley, Chief Forester, United States Forest Service, vice-chairman.

Howard Andrews, National Association of Railroad Tie Producers, Nashville, Tennessee.

Richard H. Aishton, president American Railway Association, Washington, D. C.

Hugh P. Baker, Executive secretary, American Paper and Pulp Association, New York City.

John W. Blodgett, Grand Rapids, Michigan.

Wilson Compton, secretary and manager, National Lumber Manufacturers' Association, Washington, D. C.

Dwight Hinckley, president National-American Wholesale Lumber Association, Cincinnati, Ohio.

A. G. Hopcraft, president National Association of Purchasing Agents, Cleveland, Ohio.

Le Roy E. Kern, American Institute of Architects, New York City.

John H. Kirby, president Kirby Lumber Company, Houston, Texas.

John E. Lloyd, president Wm. M. Lloyd Company, Philadelphia, Pennsylvania.

General R. C. Marshall, Jr., general manager Associated General Contractors of America, Washington, D. C.

John V. W. Reynders, president American Institute of Mining and Metallurgical Engineers, New York City.

D. Everett Waid, president American Institute of Architects, New York City.

Walker L. Wellford, president Chickasaw Wood Products Company and Chickasaw Co-operate Company, Memphis, Tennessee.

Norman W. Wilson, president American Paper and Pulp Association, Erie, Pennsylvania.

Wm. A. Babbitt, Association of Wood-Using Industries, South Bend, Indiana.

W. L. Saunders, general manager Cummer Diggins Company, Cadillac, Michigan.

Louis J. Taber, master of the National Grange, Columbus, Ohio.

Frank G. Wisner, president National Lum-

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Among prominent men who are Lutton owners we may mention: Richard Delafield, Tuxedo, N. Y.; W. W. Knight, Toledo, Ohio; Carl Tucker, Mt. Kisco, N. Y.; R. K. LeBlond, Cincinnati, Ohio; E. M. Herr, Pittsburgh, Pa.

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ber Manufacturers' Association, Laurel, Mississippi.

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The proceedings of the National Conference on Utilization of Forest Products has been published and copies may be secured from the Forest Service.

WEST VIRGINIA NOW HAS A FOREST, PARKS, AND CONSERVATION COMMISSION

The last legislature of West Virginia passed an act creating a State Forest, Parks, and Conservation Commission, to be composed of the Governor of the State, the Commissioner of Agriculture, the Director or Agricultural Extension, the State Geologist, the chairman of the Fish and Game Commission, *ex officio*.

The duties of the commission are to study and investigate the needs and opportunities for forests, parks, game reserves, and other conservation measures; to make a comprehensive report of the results of its investigations to the next session of the legislature and to prepare such bills as may be necessary to carry out its recommendations and submit them with its report.

The existing forestry law was also amended to enable the state to propagate and distribute forest trees and to co-operate with the Federal Government under the Clarke-McNary law.

MORE MILITARY RESERVATION NATIONAL FORESTS

Under the provisions of the Clark-McNary Act, six more military reservations have been designated as National Forests, or parts of existing National Forests.

The Knox National Forest is a part of Camp Knox Military Reservation, located thirty-one miles southwest of Louisville, Kentucky.

Part of Ft. Brady target range military reservation west of Sault Ste. Marie, Michigan, known as the Brady district of the Michigan National Forest.

Near Sturgis, South Dakota, the Ft. Meade wood and timber reservation is made a part of the Black Hills National Forest.

The new Pole Mountain district of the Medicine Bow National Forest is a part of Ft. D. A. Russell target and maneuver reservation near Cheyenne, Wyoming.

The Coronado National Forest, near Tombstone, Arizona, gets a new district known as the Huachuca, which is a part of the Ft. Huachuca military reservation.

Illinois gets its first National Forest through the designation of a portion of the Savanna proving ground military reservation, nine miles northwest of Savanna, Illinois.

All of these new National Forests will be put under administration as soon as funds

are available, but under the provisions of the law the areas will still be available for unhampered use of the War Department for purposes of national defense.

The areas listed are comparatively small, but some of them contain a good growth of timber.

ANOTHER STATE FOREST FOR TEXAS

On April 7 Governor Miriam A. Ferguson signed a bill setting aside for forestry demonstration purposes, under the auspices of the State Forestry Department, 2,150 acres of land in Cherokee County formerly owned by the Texas Prison System. A recent inspection of this area by the State Forester indicates that the land involved has on it between 6,000,000 and 7,000,000 feet of merchantable second-growth short-leaf pine and a wealth of smaller material which will attain sawlog size in six or seven years. The merchantable timber, at current stumpage prices, has an estimated value of \$35,000, and it is estimated that in six years' time the value of the timber will be in the neighborhood of \$60,000, due to natural growth and increase in stumpage values. Citizens of Cherokee County are now endeavoring to make up a purse to assist in buying approximately 560 acres needed to block out the State Forest tract. The State Forestry Department will contribute \$6 an acre toward the purchase price of this additional area.

The Cherokee State Forest area presents a splendid opportunity for demonstration work along the lines of selective cuttings, thinning of short-leaf pine during various stages of growth, and the influence of fire upon reproduction and rate of growth.

Active work in putting the Cherokee State Forest area and the Kirbyville State Forest in the long-leaf region under administration will be inaugurated September 1, through an appropriation of \$7,000 made available by the State Legislature.

MISSOURI FORESTRY ASSOCIATION PLANS TO UNDERWRITE NEW STATE FORESTRY DEPARTMENT

Because Governor Baker vetoed the appropriation of \$10,000 a year for two years to carry the salary and expenses of a state forester authorized by a law recently passed by the Missouri legislature, an attempt to raise \$10,000 a year for five years for this purpose will be made by the Missouri Forestry Association.

This was decided upon at the annual meeting of the Association at Hotel Chase in St. Louis on June 2.

Dr. Hermann von Schrenck was re-elected President of the Association and Frederick Dunlap secretary.

STATE PARK MEETING IS HELD AT SKYLAND

Skyland, four thousand feet above the sea, and in the heart of the Virginia mountains, selected to form the Shenandoah National Park, was the scene of the Fifth National Conference on State Parks, held May 25-28, inclusive. The meeting was attended by several hundred representatives interested not only in the subject of State Parks, but of getting a glimpse of the region proposed for the first large National Park in the East.

The Conference was an outdoor meeting almost entirely, since practically all of its sessions were held in the open and were so arranged as to enable those in attendance to see a number of the attractive features of the mountain region. On Tuesday, May 26, the Conference moved by horseback to White Rock Canyon to inspect the cascades. The evening of the same day the guests were treated to a gigantic bon-fire and fireworks display on the Indian pow-wow grounds about a mile from the Skyland Lodge. Wednesday's program transferred the Conference to Crescent Rock Cliffs where a chicken lunch was served and the afternoon session held. On Thursday arrangements were provided for guests to visit the Luray Caverns about a mile from the town of Luray and to tour the Shenandoah Valley.

In addition to the regular business session, the program included addresses from many prominent men, among whom were Governor Trinkle of Virginia; Hubert Work, Secretary of the Interior; Gilbert Grosvenor, president the National Geographic Society; Chauncey J. Hamlin, chairman National Conference on Outdoor Recreation; Frederick A. Delano, president Federated Societies; Doctor John C. Merriam, president Carnegie Institute, and director of The American Forestry Association; Stephen T. Mather, director National Park Service; James L. Greenleaf, president American Society of Landscape Architects, and John Barton Payne, chairman National Conference on State Parks.

One of the most important resolutions passed by the Conference formulated a set of principles to apply to road development in park areas. These principles, briefly summarized, are, road development in parks to be designed to promote the highest use of the natural recreational resources of the area rather than the resources being developed to promote travel; (2) each park should have an adequate system of transportation routes; (3) the park road system along automobile routes leading to camp grounds should be planned with reference to adequate parking areas and supplemental foot trails leading to points of interest and beauty; (4) each park is a separate and distinct problem in road planning, and road building must be co-ordinated closely with the plan of development contemplated in each case; (5) conservation should pre-

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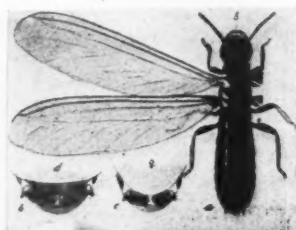
vail in developing a system of transportation routes and structures in public parks.

The Conference elected the following Executive Committee to serve for the ensuing year:

John Barton Payne, chairman; Stephen T. Mather, vice-chairman; Beatrice M. Ward, secretary-treasurer; John Oliver La Gorce, vice-president National Geographic Society, Washington, D. C.; Wilbur A. Nelson, State Geologist, Nashville, Tennessee; Albert M. Turner, Field Secretary, Connecticut Park and Forest Commission, Hartford, Connecticut; James L. Greenleaf, president American Society of Landscape Architects, 1 Broadway, New York City; Major Wm. A. Welch, general manager, Palisades Interstate Park, 25 Broadway, New York City; Ransom Kennicott, Forest Preserve District of Cook County, Chicago, Illinois; Theodore Wirth, Superintendent of Parks, Minneapolis, Minnesota.

FLYING ANTS IN BUILDINGS

Each spring or fall numerous small flying ants, our native termites, or white ants, emerge from the woodwork of buildings that



(a)



(b)



(c)

- (a) The flying ant or winged adult of our common, native subterranean termite.
- (b) The worker form which does the damage to the wood and in which it remains hidden.
- (c) The egg-laying queen, which is seldom seen.

have not been properly constructed. They have entered the woodwork of the building because somewhere there is untreated wood in contact with the ground.

Recently the Bureau of Entomology has been advocating slight modifications of the building regulations of various cities in efforts to prevent attack by these insects. No untreated wood should be laid on or in

the earth and untreated beams should have at least an inch of concrete between them and the earth. Where it is desired to put wood in direct contact with the earth, it should first be impregnated with coal-tar creosote. If this is not practical, concrete or stone foundations should be used. No lime mortar should be used in brickwork in foundations of buildings, since termites are able to penetrate lime mortar after a few years' service. Such brickwork, either on or extending below the surface of the ground, should be faced and capped with concrete at least one inch thick.

These insects are not like ants, which can be killed by insecticides or fumigation. They must be prevented from getting into the building from the ground by means of the burrows through untreated woodwork.

The Department of Agriculture has received as many as 200 requests this year for help in getting rid of these flying ants. It is a great hardship for a householder on a moderate salary to have to spend several hundred dollars one or two years after purchasing a building, because of damage by termites. The fault is with the architect or constructor, and the householder should not have to pay. By insisting on complete insulation of all untreated woodwork from the ground, insurance against attack by termites can be secured.

JOY SUCCEEDS PAPE AS STATE FORESTER OF WASHINGTON

George C. Joy, Chief Fire Warden of the Washington Forest Fire Association since 1913, has been appointed to succeed Fred E. Pape, State Supervisor of Forestry for Washington. Mr. Pape has been with the state since 1916.

Special interest attaches to Mr. Joy's announced policy of thorough protection of cut-over lands as well as those covered with merchantable timber.

LUMBER ASSOCIATION APPOINTS FORESTERS TO STAFF

In order to have available to its members the services of capable forest engineers, the Northern Hemlock and Hardwood Manufacturers Association has recently appointed the firm of Banzhaf and Watson, Inc., of Milwaukee, to its staff.

Individual members of the Association have already used these foresters on forestry experiments of a semi-commercial scale and the membership in general is interested in working out selective cutting and fire prevention practices adapted to the hemlock hardwood type of forest in the Lake States.

In one project already under way on the lands of W. A. Holt, it is estimated by Mr. Banzhaf and Mr. Watson that an annual cut of 500,000 feet can be assured continually from a tract of 1,800 acres, and a first selected cut of 350,000 feet has been made during the past season.



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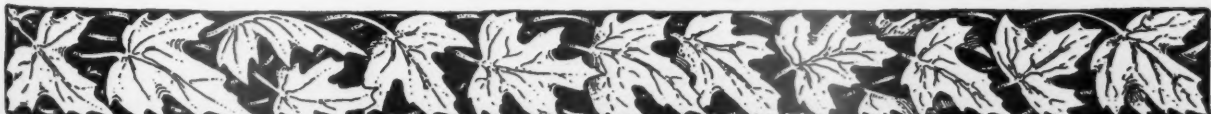
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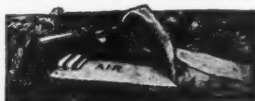
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The supply of the following issues of the Association's magazine is very low or completely exhausted:

All issues previous to 1921.

April, September, October, November, and December, 1921.

October and November, 1922.

January and December, 1923.

It will be appreciated if members having copies of these issues, for which they have no further use, will send them to the Association so that they will be available to libraries, schools, and individuals who wish to complete certain volumes.

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Mention AMERICAN FORESTS AND FOREST LIFE—It Helps

NEW HAMPSHIRE CLUB BOYS MAN- AGE PINE WOODLOTS

Club boys in New Hampshire have demonstrated, through a junior extension forestry project, that trees may be looked upon and managed as a crop, if given attention under the direction of a forestry expert. The work has been received with enthusiasm and has served its purpose very effectively. It consists of two general types of activity—planting and thinning. Sometimes the latter work is referred to as improvement cutting, or weeding.

The boys who take part in the tree-planting division are expected to plant at least a fourth of an acre between March 1 and June 1 this year. The extension agent will supervise the purchase and planting of the trees. Each club member is to report the number of trees living on October 15, 1925.

Thirty-one boys enrolled in the planting work last year and set out over 13,000 seedlings. Some of these were planted by boys on town land, some on national reservations, and others on the home farm woodlot. Several boys enrolled for thinning. The planting work received more popular support and public praise than the wood-lot-management phase. To give this new project a start, the Society for the Protection of New Hampshire Forests has offered generous money prizes for a state and county forestry contest which started this past fall. Six counties have entered and a fresh impetus is being given the junior forestry work. The contest will extend until next October.

STUDY WILL REDUCE DECAY LOSSES IN PULPWOOD

As a result of the study of experts of the Forest Products Laboratory made possible by a fund contributed by a group of 33 interested mills, a first report has been issued on the reduction, through improved storage, of decay losses in pulpwood.

Yard sanitation and the use of chemical deterrents are suggested, and their effect on molds which discolor pulp and on wood-destroying fungi are discussed in the report, Bulletin 1298 of the United States Department of Agriculture.

MINNESOTA LOSES A LAKE

Minnesota is minus one of its famous "ten thousand lakes," as the result of the disappearance of Bass Lake, a body two miles long and one mile wide. The water has escaped into Low Lake, which adjoins Bass Lake, and thence into international waters. The water made its escape over an old sluice bed cut out years ago by lumber companies, according to the theory advanced by foresters.

WHITE PINE MAINTAINS ITS LEAD IN THE ENLARGED REFOREST- ING PLANS IN NEW YORK STATE

Plans have just been completed for the most extensive reforestation operations ever undertaken in this country, through the enlargement of the Commission's nurseries, so as to produce between 35,000,000 and 40,000,000 two-year-old trees for planting in 1927.

This is nearly four times the present output of the nurseries and is made possible by the appropriation of \$120,000 for reforestation made by the legislature this year.

The number of seed beds in the nurseries has been increased to 4,568, the beds having an average capacity of more than 8,000 young trees.

The supply of young trees that will be produced by 1927 from the seed to be planted this spring would plant about 40,000 acres—an area larger than the county of New York, Richmond, or Bronx.

There will be 1,542 beds sown with white-pine seed, which will require 1,165 pounds, estimated to produce 12,336,000 trees. These white-pine seeds have been obtained from New York, Wisconsin, Minnesota, and the Province of Ontario.

There will be 1,080 beds of red or Norway pine, requiring 300 pounds of seed, estimated to produce 10,800,000 trees. A portion of these seeds was collected in the Adirondacks and some have been purchased in Minnesota and the Province of Ontario.

Other seed beds will contain Scotch pine, to raise two million trees; slash pine, Corsican pine, European larch, white spruce, white cedar, balsam, white ash, and black locust.

OUTDOOR SUMMER SENSE

Here are a few warning "don'ts" from the Prudential Life Insurance Company for the folks who take to the woods and the "great outdoors" for a few brief days or weeks during the summer:

"Don't be the life of the party when driving a car full of merrymakers. Keep to the right of the road, watch your wheel and speedometer, and let the others do the singing.

"Don't be the fool who rocks the boat. Even if you can swim, perhaps others cannot.

"Don't bring home from the woods a basket of mushrooms to give the family a treat for supper, and an hour or two after, between groans, 'guess they must have been toadstools.' Make sure you know the difference before picking.

"Don't be the nature-lover who cannot resist drinking from every babbling brook. The most sparkling water may contain typhoid germs.

"Don't go in swimming after a heavy meal. Don't take any hard exercise for an hour or so after such a meal.

"Don't risk days, perhaps weeks, of pain by getting badly sunburned. Avoid being too long under the direct rays of the sun, particularly when wet with salt water.

"Don't be rash in thunder-storms. Keep out of drafts, from under trees, and away from metal. Don't stay in the water.

"Don't get impatient with the camp fire and spill kerosene on it to speed up the cooking.

"Take a first-aid kit on every hike and review the manual before starting.

"Carry your own drinking cups on picnic jaunts.

"Nature is a kind, beneficent mother to those who respect her laws and use their intelligence, but a stern disciplinarian to the foolhardy and reckless. It cannot be estimated what the saving of life would be every summer, were pleasure-seekers to take reasonable care of their health and precaution in avoiding accidents. Use your brains to help make it a safe and sane summer."

LONG-BELL LUMBER COMPANY INVESTIGATES FORESTRY

The National Lumber Manufacturers Association is authority for the statement that a system of forest management and protection on more than 200,000 acres of its lands in Arkansas, Louisiana, and Texas has been instituted by the Long-Bell Lumber Company, which is now studying its Pacific Coast holdings with a similar purpose.

Fire protection, through the use of intensive patrol and fire breaks of different types, experiments in selective logging, study of growth and yield through permanent sample plots and experimental planting of longleaf pine on a commercial scale are said to be features of the program.

J. B. Woods, forester for the company, is now studying its holdings in Washington, Oregon, and California.

TENNESSEE FORESTRY ASSOCIATION MEETS AT NASHVILLE

"The cheapest thing a tree does is to furnish lumber," said Dr. James I. Vance, addressing the Tennessee Forestry Association meeting in Nashville, May 27.

He added that the next great thing for the state to undertake is a campaign for the perpetuation of its forests.

State Forester R. S. Maddox reported that Tennessee had seen fires since Christmas to May 1, and said that of that number 651 were extinguished, 3,616 men engaging in the work of putting them out, but that these fires had burned over 272,000 acres. The number fighting the fires to the extinguishing point indicated the sentiment abroad in behalf of forest conservation, Mr. Maddox said, citing back to four years ago, when most of the forest fires had been left to burn themselves out.

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Trees protect you. They break the force of the wind, the rain and the snow. They shelter the game, the fish, the birds that make vacation-land a joy. They're *your* trees. Safeguard them.

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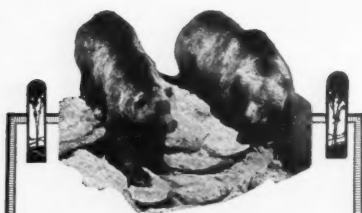
When you're through cooking simply turn the Coleman out and fold it up—nothing left to start trouble—not even ashes.

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WILL STUDY PINE WEEVIL

Gifts of \$5,000 for two years' study of white-pine weevil, which severely damages timber each year by destroying the terminal shoots of young trees, were recently announced by Director S. T. Dana, of the Northeastern Forest Experiment Station, at Amherst, Massachusetts.



THIS CHINESE ELM, IN CARLSBAD, NEW MEXICO, SHOWS THE ADAPTABILITY OF THE TREE TO THE SOUTHWEST REGION FOR SHADE AND DECORATION

CHINESE ELM GROWS RAPIDLY IN "TREELESS SOUTHWEST"

By ALLEN P. CHILD

A singular feature of the Chinese elm, whose native home is in northern China and Manchuria, is that it succeeds equally well in the arid Southwest, the Eastern States, and the northern Great Plains region. Its adaptability to street and park shading is being demonstrated in Carlsbad, New Mexico, where, during a period of six years, a remarkable growth has been demonstrated. The tree comes into leaf about one month earlier than other deciduous trees of the region.

FORESTRY A LA CARTE

Among the first to see the wisdom of developing tree growth on idle and waste lands tributary and contiguous to their rights of way is the Pennsylvania Railroad. While railroad companies have long advocated cultivation of large areas of agricultural land in various regions of the country, looking to potential tonnage increase, few have taken an aggressive stand for the development of

forest lands tributary to their lines. What is done now in the way of reforestation will affect very little immediate railway tonnage; but, since railroads must necessarily plan for years ahead, they are now beginning to see the importance of providing for successive crops of forest products on lands suitable mainly for timber production.

The following statement, extracted from the back of the dining-car menu of the Pennsylvania Railroad System, sets the mark in constructive up-to-the-minute education for other railroads to follow:

"THE NEED OF FOREST PRESERVATION

"Did it ever occur to you that we owe much of the privilege and comfort of travel to the forest? Under every mile of railroad lie about 3,500 cross-ties. The railroads of the United States use annually 125,000,000 ties. In the time spent at your meal in this car, about 10,000 new ties are placed under the steel rails in our country.

"The menu before you is a forest product; 72,000,000 board feet of lumber are used annually in the United States for matches and toothpicks, and you ride in greater comfort because a band of compressed wood fiber is placed about the car wheel, just within the rim.

"The products of the forest play an important rôle in the running of every train in more than a hundred different ways.

"We use wood every day of our lives. From the cradle to the coffin it helps us live and makes our lives comfortable, yet our wood supply is becoming so low that the situation is serious. To insure an adequate wood supply, our forests must be protected and cared for.

"The greatest enemy of the forest is fire. The first step in forest restoration is to stop forest fires. Will you help? Spread the slogan **PREVENT FOREST FIRES—IT PAYS.**

"For your own part, do not throw lighted matches, cigarettes, and cigars from the car window. It may start a fire that will despoil beautiful scenery, kill wild life, suppress springs that supply pure water, and deprive our citizens of the wood they need. We must have forests to prosper as a people, and to have forests we must give the trees a chance to grow."

If the member of The American Forestry Association who wrote the Editor from Kenova, West Virginia, under date of June 4, asking that an article be published in the next edition of the magazine, explaining the inspection of hard-wood lumber and oak switch ties, will send the Editor his name and address, the information he asks for will be mailed him at once.

Fire Weather

(Continued from page 396)

co-operation from the Weather Bureau. Tomorrow it will be the same with the business of fire fighting in the forests. Intensive studies are now being made as to the relation between general weather movements and the resulting weather in particular districts or places. Already it has been found that fairly accurate humidity curves can be plotted, which suggest what the humidity will be. It may be found, too, that there is a relation between static electricity and changes in relative humidity. When the whole truth is known about these things it should be possible for the Weather Man to take a large element of uncertainty out of the weather, so far as the foresters are concerned.

ANGELES NATIONAL FOREST CUT IN TWO

Secretary of Agriculture Jardine has approved, subject to presidential assent and proclamation, the division of the present Angeles National Forest, California, into two units and the creation out of the eastern, or San Bernardino, division of a new Federal forest to be known as the San Bernardino National Forest, according to a report from the California headquarters of the United States Forest Service.

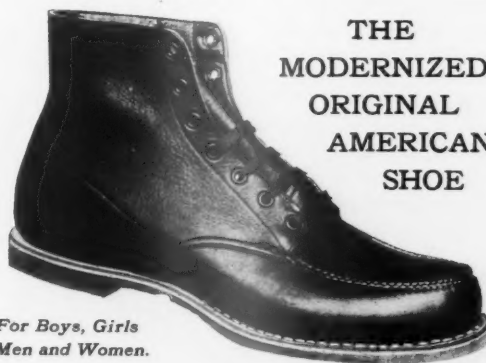
This action is in line with the findings and recommendations of the Board of Fire Review which last November made a detailed investigation of the forest protection problems in the Government forests of southern California. Better administration and fire protection are the main purposes of this new adjustment of national forest areas which comprise one of the most intensively used mountain recreation regions in the United States.

The San Bernardino National Forest will be under the supervision of S. A. Boulden, who has been supervisor of the Cleveland National Forest since 1920.

PRONOUNCED THE LAST SAD RITES

A unique ceremony took place on the Gallinas District in connection with American Forest Week at the public camp ground in Red Cloud Canyon, on the Lincoln National Forest, in New Mexico. All cans, scraps, paper, and other debris were gathered together, a grave dug, pallbearers selected from among the schoolboys, and the principal said the last sad rites, as follows: "You insignificant, unsanitary, forest-polluting, inanimate atoms of tin cans, bones, and other filthy matter, we hereby consign you to mother earth, from whence you came. Although we know you have no soul, we trust and hope that you will remain in your silent grave, and that you will not hereafter clutter up our place—this camp ground—so that those who may come after us will not find it in unclean and unsanitary condition. Amen."

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When it comes to the new way of buying shoes for children (and incidentally for the rest of the family), DADDY'S POCKETBOOK heartily approves the idea of buying one pair where three were bought before.

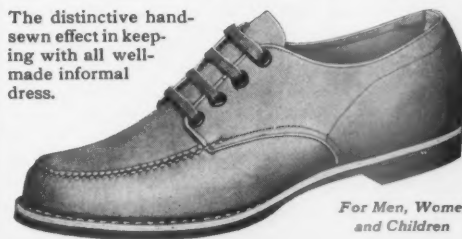
And it isn't only the pocketbook that's pleased. The sense of beauty and fitness is also well served. BASS Moccasin shod youngsters are the sturdy, smartly dressed representatives of the most wide-awake families.

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The *man, woman or child* who has once known the joy of BASS Moccasins will continue to wear them. Every member of the family will own at least one pair, for the BASS Moccasin stands for American freedom of feet, for American smartness of informal style, for economy of service that Americans are learning to demand.

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SAND DUNES AND SALT MARSHES. By Charles Wendell Townsend. L. C. Page & Company, Boston. Price \$3.50.

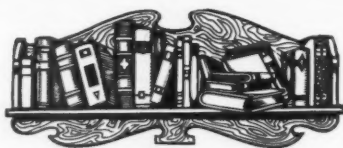
In this book Dr. Townsend, whose reputation as an authority on natural history is well known, has given a fund of information on sand dunes and marshes that will be read with delight by lovers of the sea and its environs. Long and close study of this fascinating subject—the dune in all its phases—has taught the author its every aspect. Ralph Hoffman well says in his introduction to the volume: "He knows their humblest inhabitants, the shells cast up on the beaches, the changes wrought by wind and wave, the tracks of tiny feet upon the sand, and, best of all, has caught the *spirit* of the place, which is as distinct from that of the mountains or the plains as Athens is from Rome."

Though replete with facts of great value to the student of the subject, the author's intense love of it colors his work throughout.

Beautifully made, the book is illustrated with nearly a hundred excellent half-tones made from photographs, as well as some very interesting old maps showing the sand dunes of Ipswich, New England, in 1786.

A GUIDE TO THE TREES. By Carlton C. Curtis, Ph. D., Greenberg, Publisher, New York. Price, \$1.50.

An excellent guide, because it is compact, has simple keys, good line drawings, a thorough glossary and covers a most complete list of trees and shrubs native to the northeast quarter of the United States, the Appalachian system and the north half of



BOOK REVIEWS

the Great Plains. Anyone who wants to know about trees can get prompt and accurate help from this volume with the minimum effort.

STORIES IN TREES. By Mary Isabel Curtis. Lyons & Carnahan, Chicago, Illinois.

Fact and fancy are so delightfully interwoven in this collection of fourteen legends and fourteen tree stories, that grown-ups as well as the kiddies, for which it was essentially written, will enjoy it from cover to cover. Using a few well-known legends as a basis—and a few not so well known—the author has varied and improved the original themes of these to appeal particularly to the imagination of the child so that it reads with pleasure and all unconsciously absorbs the lesson of the service of the trees which the author has so cleverly embodied.

Extremely effective original illustrations have been done in color by Jewel Morrison.

PAUL BUNYAN. By Esther Shephard. The McNeil Press, Seattle, Washington.

A recital of the feats of strength and endurance performed by Paul Bunyan, hero of the American lumberjack. This collection of stories which the author has pains-

takingly selected from hundreds of similar ones, contains only those which are of general interest and which truly appear to be a part of the Paul Bunyan cycle of lumberjack folklore.

The stories are recounted by a single teller, who claims to have worked with the mighty logger during the winter of the blue snow, to have been helper to Brimstone Bill, stable boss, who cared for Babe, Paul's powerful, but kindly, blue ox, to have been in camp when Paul helped Old Man Puget dig his sound, and to have been well acquainted with Paul's wife and his daughter Teeny, who married Ole, the camp blacksmith.

Lumberjack vernacular has been worked in just enough to give the stories a true logging-camp flavor. This is one of the first published collections of Paul Bunyan stories, having been copyrighted in 1924. Credit has been given others who have done notable research on these truly American legends.

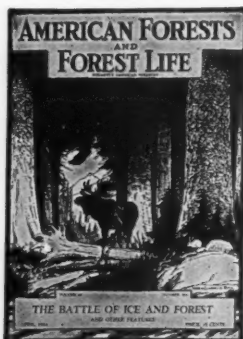
A brochure, descriptive of the organization and plans of the American Reforestation Association of Los Angeles, has been issued by that association under the title "Reforesters of America."

Written by Miss Mabel Mills, and beautifully illustrated, it contains quotations from prominent conservation authorities and others. The scope of the work as outlined covers the protection of street and shade trees as a basis for inspiring the broader appeal of forest conservation—all of which is most helpful to the cause.

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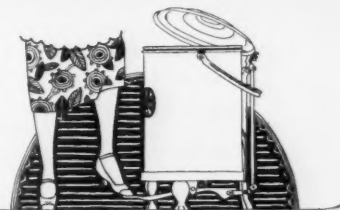
**TREES LIFT MORTGAGE FROM
WOMAN'S FARM**

"The woman wood-chopper of Wayne
County" is the title given to Mrs. Helen
Ragna, who lives on a small farm near
Honesdale, Pennsylvania, according to the
Pennsylvania Department of Forests and
Waters. In 1914 Mrs. Ragna and her hus-
band came to America from Austria. A
short time after their arrival in this coun-
try they purchased a farm near Honesdale,
for which they paid \$3,000 cash and gave
a mortgage for \$3,600. The husband, hav-
ing been in ill health for some years, died
soon after the debt was contracted. Mrs.
Ragna was greatly perplexed about her
financial obligations, but after a full sur-
vey of the property turned to a 6-acre wood-
lot as her salvation. She was offered \$1,600
for the woodlot. Feeling that she could re-
alize more than this amount, Mrs. Ragna
donned working clothes and with ax and
saw worked day after day with her 17-year-
old stepson, cutting down the trees and con-
verting them into marketable logs. The
larger trees were cut into sawlogs, while
the smaller stuff was used for mine props,
ties, and lagging.

During the past two winters these two
wood-choppers have been working diligently
with their ax and saw, and as a result
stepped from beneath the heavy burden of
debt, for they received a total of \$2,000
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emergency occurs and when hands are wil-
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cording to State Forester R. B. Miller, is
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bana. It is almost 16 feet in girth and 104
feet in height. The tallest tree in the state
is a cypress in Massac County. Its height
is 137 feet. "The oldest tree measured by
the foresters was a tupelo gum, a ring count
of which showed its age to be 330 years.
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sidered the cottonwood, which grows abun-
dantly in the Mississippi bottoms of south-
ern Illinois. It will produce sawlogs in 17
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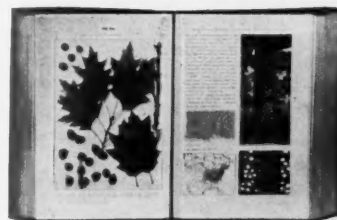
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A Forester's Search for Forests in China

(Continued from page 427)

mountain unlike the Wu Tai Chan of Shansi is covered with a fine stand of trees.

From the temple which sits on the very summit one can look down in all directions and across to higher mountains to the south. To the forester one striking thing stands out. Three sides of the mountain has the appearance of being close shaven; likewise the other mountain slopes in the distance. But on the fourth side facing the northeast is the valley, up which the trail climbs and in which are nestled fifty temples. This basin is temple property; it is well wooded, in sharp contrast to all adjacent lands.

My notes taken at the time give the following facts and estimates: "The forest cover consists of pines on the upper slopes. (*Pinus massoniana*), several hardwoods, such as oaks (*Quercus dentata*, *Q. serrata*, *Q. glauca*, *Castanea*, sp. *Celtis*, sp. *Juglans*, sp. *Catalpa*, sp. *Pterocarya stenoptera*, and *Corylus*, sp.). In thickets of shrubs grows a small bamboo which is used for making the staffs of Chinese pens. The valley was estimated to be 8 miles long and average one-fourth mile wide, having an area of about 2 square miles. Seventy per cent of this is covered with forests. Of this cover 10 per cent are conifers and 90 per cent hardwoods. The hardwood trees will average 14 inches in diameter at breast high, with an average usable length of 32 feet. With an average of 80 trees per acre, the hardwood stand would approximate 2,400,000 board feet. The pine stand would total about 400,000 feet, making a total of about 2,800,000 board feet."

This tract is an excellent demonstration forest to indicate the possibilities of similarly located valleys. Furthermore the forest is entirely reproduced naturally; no planting is done. It is therefore reasonable to suppose that this stand is a remnant of a former forest cover of the entire northerly slopes of the Tsin Ling Shan. If this be so the timber supplies available to the plain were at one time enormous.

The true significance of this temple forest seems to be lost on the local people. Trees in temple grounds are taken for granted. That the growth of trees within the pro-



W. C. Lowdermilk

A LARGE CEDAR IN THE OLD TEMPLE GROUNDS AT CHUNG PU. THE TREE MEASURED 7 FEET 6 INCHES IN DIAMETER AT BREAST HEIGHT. IT WAS VERY LIKELY ONLY A SMALL POLE WHEN HWANG TI WAS BURIED IN THE MOUNTAIN IN THE DISTANCE

Shensi and westward lands, whereby the prosperity of a large section would be much enhanced. It is now under contemplation by the provincial authorities. A supply of cross-ties is a serious problem. Being at a great distance from the port cities and railway-served centers, the importation of foreign timber is too expensive. An estimate of local supplies revealed a supply for about 5 miles of track; a supply for 100 miles of track is needed. In this wise will the interior development of China be lamentably retarded. The tremendous advantage in their early development of Europe and America, particularly due to large supplies of cheap timber at their "back doors," becomes apparent in comparison.

From Sianfu we set out northward for a three weeks' trip through the typical loess deposits of northwest China. In

tected precincts of a temple might indicate the possibility of forest growth on similar soils seems to have lost its comparative value with the inhabitants of Shensi. At least no attempt is made to produce a forest growth on these mountain slopes. They are still subject to the ravages of the annual fuel gatherer.

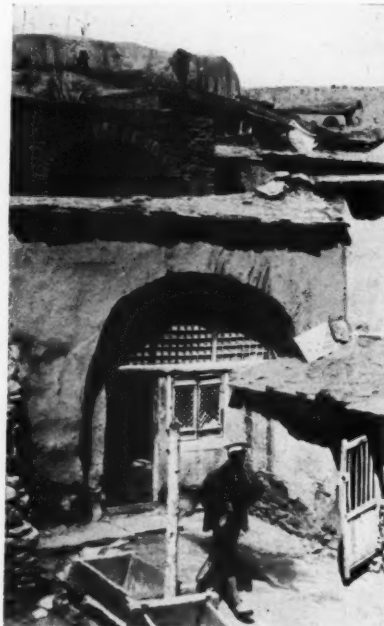
The dearth of timber supplies was particularly impressed upon us when calculating the costs of constructing a railway from Tungkwan to Sianfu. A railway is urgently needed here as one means of quick import of grain during famine times, and as an outlet to the many products of

answer to my queries about the existence of forests, various replies were given. But generally we were told that we should pass through a forest.

Late in the afternoon of the second day we left the Wei Peh plain and began the ascent along a small valley into the highlands of north Shensi, where for thirteen days of steady going we traveled on top of the loess landscape and across the incised eastward flowing tributaries of the Yellow River. This journey proved to be an excellent cross section of the loess country; for the trail led up over other secondary divides. The loess deposits in a multitude of manifestations can be studied along this Sianfu, Yenafu, Suiteh route. The loess is, first of all, a great blanket of yellowish brown, fine-grained, compact, friable material. It carves like cheese, is as fine as talcum powder and has *in situ* a vertical cleavage which causes it to stand in upright walls wherever exposed along streams or erosion gullies. It lies on a pre-eroded landscape, as confirmed by many evidences of fill and re-erosion. The present erosion has in many places excavated the gullies and valleys to the original valley floors and is now cutting into the country rock.

The loess, when deprived of a vegetative cover, erodes very rapidly. Run off waters quickly cut gullies to great depths. Some of these gullies are 600 feet deep, while those with perpendicular walls 100 to 200 feet deep are not uncommon. The vertical cleavage further aids erosion. The run off waters thereby become liquid mud which the Yellow River carries to the alluvial plain below.

As we proceeded, the amount of herbaceous, shrub, and tree cover increased as the density of population decreased and as the level tracts of loess soil had diminished. It resembled a chaparral, consisting of a variety of species, many of which could not be identified in winter condition. But *Zizyphus* (Chinese wild date) was very common at between 3,000 and 4,000 feet elevation. Above 4,000 feet, free growth was more conspicuous. On the rocky slopes and in springy places where fires would run less readily were to be found trees, of walnut (*Juglans*



DETAIL OF A SHENSI HOUSE. THE MINIMUM OF WOOD IS USED IN CONSTRUCTION. THE HOUSE CONSISTS OF CELLS BUILT IN THE LOESS OR WALLED UP WITH STONE. THE ONLY WOOD USED SERVES FOR THE LATTICE WORK AND DOOR IN THE OPENING. THE HORSE TROUGHS ARE MADE OF STONE

regia) in its native habitat, wild peach, elm (*Ulmus pumila*) and pines (*Pinus sinensis*). Pine was observed to be extending itself naturally, indicating a satisfactory site for its growth. It seemed reasonable to suppose that the deeper soils would likewise support forest growth and of greater development if destructive agencies were not at work. These evidences indicated a heavier precipitation than Sianfu enjoys.

It was a great surprise to see fires sweeping over this land where wood is in such demand. The fires are set by the inhabitants during the dry spring months when the flames run rapidly. The shrub cover is thus removed to favor grass for grazing; and trees are not allowed to grow large, or too heavy to be carried on man-back for fuel. A shrub cover is therefore more desired by the native population than a tree cover. This appears to be true rather generally. In other words the present shrub and herbaceous cover rather than a tree cover fits the pitiful transportation means of the fuel gathering population.

Strangely enough, large willow cuttings were being planted along the trail, or highway. An order had gone out from the governor that each village should be responsible for planting trees along the roads for a distance up to 10 li (3 1-3 miles) from the village gates. The unfortunate inconsistency was lamentable. For while the small crews were planting willow cuttings fires were visible sweeping over parts of the country, destroying many times more trees than the paltry effort at planting willow could produce. But such inconsistency comes with no intelligent treatment of the resources in the mountain areas.

At Chung Pu we found a mountain covered with trees which stood out in the barren, treeless, loess landscape as an emer-

ald in a setting of old gold. This stand was examined carefully, and found to consist solely of cedar (*Thuja orientalis*). It is the tomb of Hwang Ti the second, a monarch of some 30 centuries past. His august memory has protected this forest, which has been reproducing itself naturally for a long time. It is managed by public opinion. While the growth was not rapid, a few large trees were found. It was indeed a remarkable sight to come upon in the midst of the yellow, treeless, terraced hills of loess.

After leaving Chung Pu the way led over great expanses of eroding loess. The landscape is incised by great gullies which make the going difficult and wearisome. Day after day we tramped along a ridge or dropped down into a deep valley and out over another ridge. Everywhere the great gullies gaped wide as enormous wounds in the landscape. Every part of the country seemed to have been cultivated, but much has been abandoned.

A day's halt was made at Yenanfu to change our pack train of six mules. Many strange things occupied our interest in this quaint, much fortified inland city. It was, during the Mongolian invasions, the center of defense for a large section of the Great Wall to the north. But it is now a sorry relic of its former importance and prosperity. In this region willow is the principal tree grown in the valleys; it is likewise the principal construction wood. It was surprising to see large temples whose pillars and beams were made of willow. A certain amount of willow culture is carried on along the valleys. The hill tops are cultivated to wheat, and the slopes are given over to such intensive grazing of sheep and goats that a forest cover would have little chance to establish itself.

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From Yenanku we proceeded north almost to Suiteh, thence to the Yellow River. Villages are nestled down in the deep valleys along the water courses. Instead of the cave dwellings the most common type of house in this section is of stone. The minimum of wood is used in construction. The house consists of a series of arched over or vaulted cells in which no wood enters into the construction. One end is walled up with stone and the other may have a wooden wall with door and paper covered lattice for a window, or yet again may be one-half walled with stone. A wooden frame carrying a door and paper lattice for light fills the other half. We slept many times in houses of this sort.

The interior of the house possesses scarcely an article of wood. The bed is a stone and dirt platform heated from underneath by the flue from the stove. On this "kong" the beds are rolled out at night and rolled up in daytime, for it is the only place to sit. Along the walls are big earthen jars in which wheat, wool and other valuables are kept from rat and moth. The stove is a covered fireplace, which is fed grass, leaves and twigs. Such is a woodless home of northern Shensi. The blessings of forests and timber are forcibly brought home to the traveler into this region.

Finally we dropped down into the gorge of the Yellow River west of Fenchow, Shansi. Here of course the Yellow River floods are of no consequence. The Yellow River is cutting through massive sandstone and limestone. The tributary valleys are deeply incised. After a very hard day we reached a town in Shansi called Liu Lin, or Willow Forest, where we entered upon a cart road again. We took Peking carts and after four days reached Taiyuanfu, a railway terminus, thence by rail to Peking and back to Nanking.

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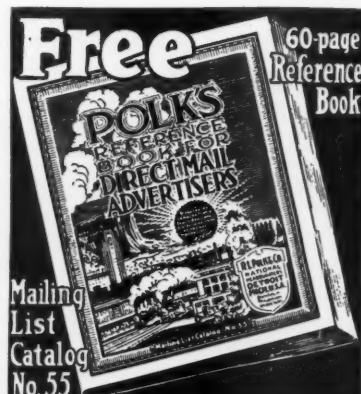
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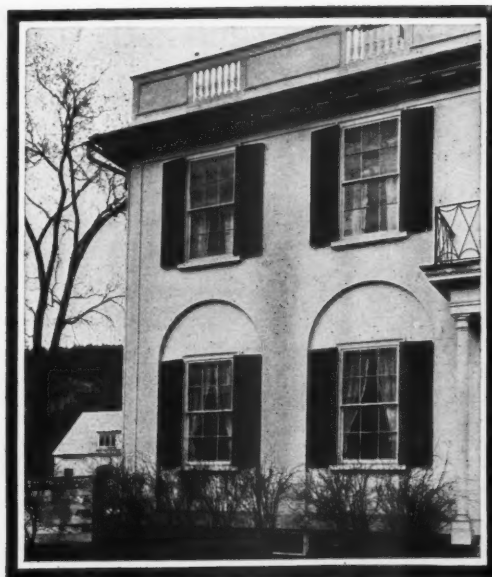
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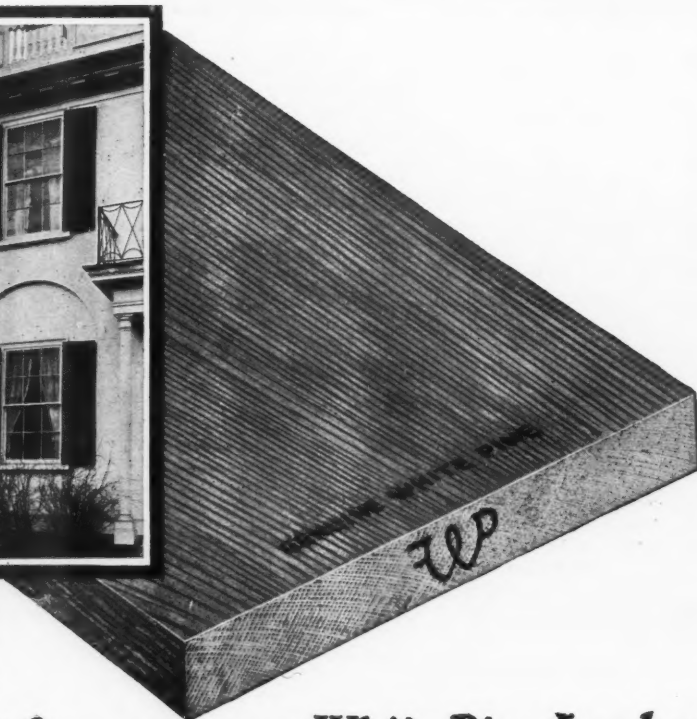
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